



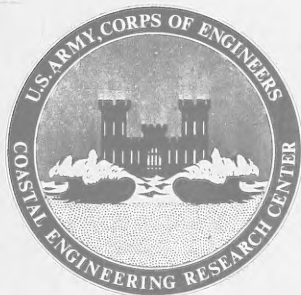
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Groins : An Annotated Bibliography

by
J.H. Balsillie
and
R.O. Bruno

MISCELLANEOUS PAPER NO. 1-72
APRIL 1972



U. S. ARMY, CORPS OF ENGINEERS
COASTAL ENGINEERING
RESEARCH CENTER

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ABSTRACT

A groin is a shore protective structure built (usually perpendicular to the shore) to trap littoral drift or to retard erosion of the shore. Considering all types of shore protective structures used by coastal engineers, the groin is one of the most controversial and most difficult to design. Because the functional and structural guidelines for design are incomplete, many groin installations fail to fulfill their intended purpose. CERC supports a continuing research program devoted to gaining a better understanding of groins. This bibliography evolved from the groin research program.

About 460 articles published since 1900 on groins and groin-type structures are presented in this bibliography. Annotations accompany each bibliographic entry where possible. Indexes of authors, titles, and subjects are included to aid the researcher. Unavailable literature such as foreign articles, although not annotated, are included as entries in both the annotated section and the indexes.

FOREWORD

This bibliography was compiled by J. H. Balsillie and R. O. Bruno under the general supervision of D. W. Berg, Chief, Evaluation Branch, and G. M. Watts, Chief, Engineering Development Division.

Indexes of the bibliography were automated by the use of a computer. Programs used were prepared by M. Keplinger of the National Bureau of Standards and B. R. Sims of the Coastal Engineering Research Center. Mr. Sims adapted these programs specifically for the compilation of this bibliography.

At the time of publication, Lieutenant Colonel Don S. McCoy was Director of CERC; Thorndike Saville, Jr. was Technical Director.

NOTE: Comments on this bibliography are invited. Readers who find omissions or errors are urged to submit their suggestions.

This report is published under authority of Public Law 166, 79th Congress, approved July 31, 1945, as supplemented by Public Law 172, 88th Congress, approved November 7, 1963.

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INTRODUCTION

Groins are shore protection structures, usually built perpendicular to the shore, that function to trap littoral drift or retard erosion of the shore. This annotated bibliography is intended to provide a ready source of published information on groins and groin-like structures.

The Coastal Engineering Research Center (CERC) and its predecessor, the Beach Erosion Board, have for many years been investigating groins both in the field and laboratory. During the past several years, the emphasis placed on investigation of groins has increased. As a result, a study is now underway to determine functional and structural behavior of groins to improve guidelines and criteria for use in their design.

As part of this investigation, the available literature was reviewed. It became apparent that the results of this review would assist others; thus, this bibliography has been compiled and published.

463 articles, published since 1900, on groins and groin-like structures are referenced by this bibliography. Appropriate annotations are provided to assist the investigator. Additionally, cross-referenced indexes for author, title, and subject have been included to facilitate access to the annotated section.

USE OF BIBLIOGRAPHY

Each entry of the bibliography consists of a code number, title, author, source, annotation, and key word list. These entries appear in consecutive order of code numbers, the code number depending in part upon the year and month of publication, as:

| | | | | | | | | |
|------------|---|---|--------------|---|---|---------------|---|---|
| 4 | 2 | 0 | 4 | G | R | 0 | 0 | 2 |
| Year: 1942 | | | Month: April | | | Serial Number | | |

Where the year or month of publication cannot be determined zeros are substituted.

For articles or reports which have been published the appropriate citation is given. At the end of the source citation, call numbers of those entries held in the CERC Library appear in parentheses.

Annotations are an integral part of this compilation. Even so, many articles, such as foreign and domestic articles that were unavailable to the authors or untranslated foreign articles have not been annotated. In some cases, the titles of foreign articles, have been translated to indicate the content of the article. U. S. Congress House Documents have not been annotated because of their similarity of

text, large number, and easy availability. All of this literature, however, is referenced in the annotated bibliography in correct sequence, and in the indexes under the appropriate headings. Notation for articles not annotated which appear in the indexes is as follows:

NA - BEACH EROSION AT SANTA BARBARA CALIFORNIA

3803GR0001

Special utility of the bibliography lies in its indexes. The author index is an alphabetical listing; the title index is an alphabetical listing of words taken out of context of the titles. To provide a subject index, key words were chosen; all articles were keyed to this listing. Before using the subject index the researcher should refer to the key-word list (page 199) to choose the subjects of interest.

In most cases the meanings of the key words are straightforward. However, to clarify any confusion that may result, a list of definitions for the key words follows the key word list (page 200).

"One Aspect of the Dynamics of a Coast
Partly Protected by a Row of Groynes"
Bakker, W. T., Unpublished Manuscript.
(TC337 .B168)

0000GR0001

A mathematical theory is given about phenomena caused by groin construction. Onshore and offshore transport are considered, but not the influence of wave refraction and diffraction. Effects of groins found in this study are: (1) in the middle of the protected part of the coast the same processes occur as without groins, but slower; (2) there are edge effects at the ends of a system where much more accretion and erosion occur than without groins; and (3) the rate of effect of the system depends upon the spacing of the groins.

Key Words - Theory/Erosion/Accretion/System/Transport-normal/

"The Coastal Dynamics of Sand Waves and the
Influence of Breakwaters and Groynes"
Bakker, W. T., Unpublished Manuscript.
pp. 1-7. (V.F. 3249-a BAK)

0000GR0002

At a coastline where littoral transport by waves prevails, progressive sand waves can exist, if there is a periodical varying disturbance at one point on the coast and the coastline is at rest at more than half a wavelength distance. These sand waves (or mega-ripples) move from the point of disturbance to the part of the coastline that is at rest, independent of the direction of the littoral transport. Wavelength increases with the period, but the velocity of propagation decreases. A groin reflects a part of the sand wave. The amplitude of the sand wave near the groin on the side of the disturbance increases; a decrease occurs on the other side of the groin.

Key Words - Theory/Impermeable/Erosion/Accretion/

"Influence of Protective Works on the Erosion
of the West Coast of Sylt, North Sea Coast of
Germany"
Fischer, O., Translation, 12 pp. (TC273 .F9)

0000GR0003

Measurements of the beach on the west coast of Sylt showed that groins and other existing protective structures were independent of subsequent successions of accretion and erosion. The author proposes that original studies maintained over a short period of time were applied to a long period and did not constitute a proper basis for conclusions for beach protection.

"Model Tests of Beach Break at the End of
Stabilized Coastal Beaches (Lee-Erosion)" 0000GR0004
Hansen, W., Proceedings of the Testing
Institute of Hannover, Hannover, Germany,
No. 10, pp. 86-119.

Key Words - Not Annotated/

"The Wosenitz Precast Permeable Groin" 0000GR0005
Wosenitz, W. B., The Permagroin Company,
Inc., Dania, Florida.

This brochure states that the Wosenitz concrete permeable groin,
precast with steel reinforcing rods, is specifically designed to
assist in building up beaches to a gradual energy-absorbing slope
which is the natural method of controlling erosion. Field examples
are provided.

Key Words - Wosenitz/Concrete/Permeable/Steel/Piling/Structural-
design/Const-procedure/Accretion/Field/Erosion/
S. Atlantic/1965-1969/Patent/

"The Budd Horizontally Permeable Groin 0000GR0006
System for Beach Erosion Control and
Rebuilding Sand Beaches"
Anonymous, E. & E. Associates, Venice,
Florida, 8 pp. (Brochure)

Brochure presents photographic coverage of Budd groins con-
structed in Florida, and shows their effects.

Key Words - Concrete/Budd/Permeable/Field/Photographic/System/
Accretion/S. Atlantic/1960-1964/1965-1969/

"On the Length and the Internal Structure 0000GR0007
of Seashore Groins"
Sato, S., Journal of Research, Public Works
Research Institute, Vol. 1, No. 4.

Key Words - Not Annotated/

"The Principle of Increasing Permeability in Groin Construction"
Wood, S. M., A Treatise on a Modern Method of Protecting Waterfront Property, Lake Bluff, Illinois, 3 pp. (TC330 .W879)

0000GR0008

Author gives an introduction to use of groins. He says that the best groin design is that of increasing permeability seaward.

Key Words - Permeable/Misc-plan/Theory/

"Man Against the Sea: A Guide to Erosion Control"
Anonymous, Makepeace Wood, Inc., The Islander Pub. Co., Anna Maria, Florida. (Brochure) (TC330 W879)

0000GR0009

Structural design of S. M. Wood permeable groins is presented in this company brochure. Photographic coverage of various sites where Wood groins have been constructed is given.

Key Words - S. M. Wood/Permeable/Structural-design/S. Atlantic/
Misc-plan/Erosion/Accretion/

"The Protection and Improvement of Foreshores by the Utilization of Tidal and Wave Action"
Allanson-Winn, R. G., Transactions of the American Society of Civil Engineers, Vol. 50, June, 1903, pp. 66-94

0306GR0001

Case groins, constructed of timber, with a long, low design, and economical to build are discussed relative to groins of other designs. A field study is presented in favor of Case groins where the author states that an analogy of small obstructions (Case groins) and the multiplication of small results gradually brings about desired beach buildup.

Key Words - Timber/Long/Low/Economics/Europe/High/Scour/Erosion/
Accretion/Field/Case/Misc-plan/1900-1949/Impermeable/
System/Structural-design/

"Coast Erosion and Foreshore Protection"

0800GR0001

Owens, J. S., Case, G. O., Chapter 11,
St. Bride's Press, London, 1908.

Constructional details of various types of groins, jetties, sea-walls, and bulkheads are given. Details about spacing, height, and desired effect of groins are discussed briefly.

Key Words - Low/Accretion/Structural-design/

"Coast Erosion and Protection on Long
Island and New Jersey"

1508GR0001

Case, G. O., Engineering News, Engineering,
Chemical & Marine Press Ltd., London, Vol. 74,
No. 10, Sept., 1915, pp. 439-442
(V.F. 1350 8/19/15)

Failures of high groins and vertical bulkheads as coast protection works are discussed. Proper methods of design and construction of low groins which have proved successful and their application to construction in New Jersey and Long Island are presented.

Key Words - N. Atlantic/Long/Low/Concrete/Timber/Structural-design/
Economics/Impermeable/High/

"Coney Island Public Beach and Boardwalk
Improvement"

2300GR0001

Farley, P. P., The Municipal Engineers
Journal, Fourth Quarterly Issue, 1923,
32 pp. (TC345 .N73F2)

As part of the Coney Island Improvement project during the early 1920's a system of high impermeable groins was constructed. The groins were not designed to accumulate sand but rather to retain the sand which was pumped between them, to reduce scour by confining the sand between the high barriers, and to break up the sea in time of storm.

Key Words - N. Atlantic/System/Misc-plan/Artificial-fill/Timber/Piling/
Rubble-mound/High/Long/Impermeable/Scour/Field/Structural-
design/1900-1949/

"Causes of Coast Erosion and Accretion"
Case, G. O., The Surveyor, and Municipal
and County Engineer, London, Vol. 69,
No. 1777, 1926.

2600GR0001

Key Words - Not Annotated/

"Sea Defence: Erosion and Protection on a
Sandy Coast"
Mobbs, S. W., The Surveyor, and Municipal
and County Engineer, London, Dec., 1927.
(V.F. 1339)

2712GR0001

British (1927) methods for the construction of timber and concrete groins and their costs are presented.

Key Words - Europe/Timber/Impermeable/Concrete/Steel/Structural-
design/Economics/1900-1949/Mobbs/Field/

"Tests with Scale Models to Determine the
Effect of Currents and Breakers upon a Sandy
Beach, and the Advantageous Installation of
Groins"
Kressner, B., Bautechnik, Berlin, Vol. 25,
June, 1928. (Translation GC211 .K1)

2806GR0001

A comprehensive research paper. Report deals with experiments concerning existing groin structures found along the German coastline. Groin models were used to experimentally find advantageous construction design. Length, spacing, accretion, leeward erosion due to coastal currents were qualitatively evaluated through experiments.

Key Words - Europe/Experimental/Model/Accretion/Erosion/Impermeable/
Theory/

"Die Buhnenwirkung"
Winkel, R., Die Bautechnik, Berlin, Vol. 6,
No. 27, June, 1928. (V.F. 3100)

2806GR0002

Translated Title: "The Action of Groins"

Key Words - Not Annotated/

"Detail of Concrete Block Used in Groins
Constructed at Montecito, Calif."
Leeds and Barnard, Feb., 1929, Consulting
Engineers, Los Angeles, Calif.
(V.F. 3101)

2902GR0001

Design plans for proposed concrete blocks that were used on the Montecito (Santa Barbara), California, groin project are presented.

Key Words - S. Pacific/Concrete/Geometric-shapes/Impermeable/

"The North Shore Versus Lake Michigan"
Wood, S. M., A Treatise on Methods of
Saving Lake Front Property, Lake Bluff,
Illinois, 1930. (Brochure) (V.F. 3104)

3011GR0001

Book discusses in a non-technical manner the problem of lake front protection as it affects property owners along the North Shore of Lake Michigan. Fully illustrated; the book gives examples of poor groin construction as well as satisfactorily performing groin structures of different design.

Key Words - Permeable/S. M. Wood/High/Impermeable/Timber/Steel/
Short/Accretion/Misc-plan/Rubble-mound/Low/T-groin/
Long/Scour/Erosion/1900-1949/Great Lakes/Field/
Single/System/

"Report of Advisory Board on Beach
Protection, Los Angeles County"
Advisory Board on Beach Erosion,
Dec., 1930, Los Angeles, Calif., 53 pp.

3012GR0001

Views by the Advisory Board are expressed about advantageous structural design of groins so that existing structures be made more effective and gradually build a uniform beach.

Key Words - Timber/Low/Scour/Accretion/Concrete/Steel/Piling/High/
System/Long/Short/Single/Erosion/1900-1949/Structural-
design/

"Report to the Fifteenth International
Congress of Navigation"

3100GR0001

Pala, F., and d'Arrige, A., Fifteenth International
Congress of Navigation, Permanent International
Association of Navigation Congresses, Brussels,
2nd Section - Ocean Navigation, 2nd Question,
No. 79, 1931, 24 pp. (TC5 .In8n)

The theory and purpose of groins, their design, and examples are discussed in this report on coastal erosion and shore protective structures.

Key Words - Impermeable/Accretion/Single/System/Short/Timber/Theory/
Field/Europe/1900-1949/Misc-plan/

"Report to the Fifteenth International
Congress of Navigation"

3100GR0002

Schmidt, R., and Heiser, I., Fifteenth
International Congress of Navigation,
Permanent International Association of
Navigation Congresses, Brussels, 2nd Section -
Ocean Navigation, 2nd Question, No. 73, 1931,
31 pp. (TC5 .In8n)

The theory and purpose of groins, their design, and examples are presented in this report on coastal erosion and shore protection structures.

Key Words - Accretion/Europe/1900-1949/System/Structural-design/
Misc-plan/Const-procedures/Single/Piling/Rubble-mound/
Timber/Impermeable/Erosion/

"Sea Walls and Groins of Steel Sheet piling
Stabilize Miami Beach"

3105GR0001

Taylor, L. B., Engineering News-Record,
McGraw-Hill Pub. Co., Vol. 106, No. 19,
May 1931, pp. 760-762.

This article gives the plans, cost and performance of a groin that was constructed at Miami Beach. The steel groin consisted of Larsen steel sheetpiling.

Key Words - Const-procedure/Economics/Steel/Structural-design/Timber/
Piles/Impermeable/

"Sand Movement and Beach Erosion"
Dent, E. J., Civil Engineering, ASCE,
Vol. 1, No. 9, June, 1931, pp. 821-826.
(V.F. 297)

3106GR0001

Economic and esthetic solutions for problems of shore protection are discussed. High and low groins are discussed in light of the effect desired under specific beach and littoral conditions.

Key Words - High/Long/Single/System/Low/Economics/Misc-plan/N. Atlantic/
1900-1949/

"Fort Fisher, N. C."
U. S. Army, Corps of Engineers, House
Document No. 204, 72d Congress, 1st Session,
Jan., 1932.

3201GR0001

Key Words - House Document/Not Annotated/

"Protection of Coasts Against the Sea, with
or without Preponderating Coastal Drift of
Materials"
Coen-Cagli, M. E., World Ports, American
Shore and Beach Preservation Association,
Vol. 20, No. 4, Feb., 1932, pp. 286-293

3202GR0001

The design and method of construction of groins for the protection of sand and pebble beaches must be preceded by a careful study of the locality and all forces acting on the coast. Groin height, length, the terminal groin, and groin spacing are considered.

Key Words - Misc-plan/Structural-design/Accretion/Erosion/Terminal/
Single/System/Timber/Impermeable/1900-1949/

"Du-Plat-Taylor Adjustable Screw Pile
Groynes"
Anonymous, The Engineer, London, June, 1933,
4 pp. (TC257 .B1 3)

3306GR0001

An adjustable screw pile groin was developed in England. The screw piles, 8 to 10 feet long, are tubular with iron screws cast on to them. The planks are held to the piles by retaining collars.

Slotted arrangement of bolt holes allows the planks to assume a considerable angle with the horizontal in the vertical plane. Advantages of these groins are cheapness, rapidity of construction, and facility of adjustment.

Key Words - Low/Timber/Du-Plat-Taylor/Structural-design/Impermeable/
Adjustable/

"Art of Forming Protective Beaches" 3309GR001
Wood, S. M., U. S. Patent Office, Patent
No. 1,928,473, Sept., 1933, 3 pp.

This patent presents a permeable stone groin design by S. M. Wood.

Key Words - Structural-design/Great Lakes/System/Rubble-mound/Concrete/
Permeable/Impermeable/Scour/Accretion/Patent/

"Groynes" 3400GR0001
Matthews, E. R., Coast Erosion and Protection,
3rd ed., Charles Griffin and Co., Ltd.,
London, 1934, 228 pp. (TC330 .M43)

Two chapters in this text deal with groins. Efficiency and cost of different groin designs as compared to that of Case-groins are given with reference to specific construction projects on the coast of Great Britain. The author gives a three-part presentation dealing with (1) high timber groins, (2) low timber groins, (3) concrete-block groins.

Key Words - Concrete/Timber/Misc-materials/Field/High/Low/Long/
Structural-design/Case/System/1900-1949/Economics/
Piling/Short/Impermeable/Europe/

"Wrightsville Beach, N. C." 3401GR0001
U. S. Army, Corps of Engineers, House Document
No. 218, 73d Congress, 2d Session, Jan., 1934.

Key Words - House Document/Not Annotated/

"Beach Erosion at Galveston, Tex."

3406GR0001

U. S. Army Corps of Engineers, House Document
No. 400, 73d Congress, 2d Session, June, 1934.

Key Words - House Document/Not Annotated/

"Permeable Groins of Concrete Check Beach
Erosion"

3500GR0001

Howard, E. A., Engineering News-Record,
McGraw-Hill Pub. Co., Vol. 114, No. 17,
1935.

Key Words - Not Annotated/

"Beach Erosion at Folly Beach, S. C."

3404GR0001

U. S. Army Corps of Engineers, House Document
No. 156, 74th Congress, 1st Session, Apr.,
1935.

Key Words - House Document/Not Annotated/

"Jetty"

3505GR0001

Wood, S. M., U. S. Patent Office, Patent
No. 2,000,312, May, 1935, 3 pp.

This patent presents a groin design which will provide outwardly increasing permeability. S. M. Wood groin designs are usually for Great Lakes use, but this design is recommended for ocean use.

Key Words - Patent/Structural-design/Permeable/Piling/Concrete/Timber/
Steel/Const-procedure/Erosion/Scour/Accretion/

"Jetty"

3505GR0002

Wood, S. M., U. S. Patent Office, Patent
No. 2,000,311, May, 1935, 4 pp.

An S. M. Wood groin design is presented in this patent. The design utilizes precast concrete units held by piling. Its characteristics also include permeability and use for lakeshore protection.

Key Words - Patent/Structural-design/Concrete/Const-procedure/
Timber/Piling/Steel/Permeable/

"Beach Erosion at Compo Beach, Westport, Conn."
U. S. Army Corps of Engineers, House Document
No. 239, 74th Congress, 1st Session, June, 1935.

3506GR0001

Key Words - House Document/Not Annotated/

"A New Method of Construction in Coast
Erosion Control"
Wood, S. M., Bulletin of the Associated State
Engineering Societies, July, 1935.

3507GR0001

Author discusses the inadequacies of impermeable groins and
promotes the permeable concept for groin design.

Key Words - Concrete/Permeable/Impermeable/Accretion/High/Scour/

"Die Schutzbauten auf der Insel Borkum"
Hibben, B., Bautechnik, Berlin, Vol. 13,
No. 53, Dec., 1935, pp. 691-712. (Translation,
V.F. 2023)

3512GR0001

Construction, performance, maintenance, of various types of groins
and seawalls, and a review of reef and inshore changes at Borkum Island
are presented.

Key Words - Misc-plan/Structural-design/Maintenance/1900-1949/
System/Field/Piling/Timber/Steel/Const-procedure/
Economics/Rubble-mound/Erosion/Accretion/Impermeable/
Permeable/

"Reissue Patent No. 19,786"
Wood, S. M., U. S. Patent Office, Dec. 1935.

3512GR0002

Key Words - Not Annotated/

"Certain Points about Erosion, Costs,
and Measures of Protection" 361GR0001
Beach, L. H., Shore and Beach, American
Shore and Beach Preservation Assoc.,
Vol. IV, No. 1, Jan., 1936, pp. 31-33
(TC330 .Am3)

Advantages of short groins are discussed. Short groins can
always be extended. Permeable groins are held to be effective, but
their cost, it is argued, is not economical.

Key Words - Short/Long/Permeable/Economics/

"Beach Erosion at Jacob Riis Park, Long 3601GR0002
Island, N. Y."
U. S. Army Corps of Engineers, House
Document No. 397, 74th Congress, 2nd
Session, Jan., 1936.

Key Words - House Document/Not Annotated/

"Mesh Jetties" 3602GR0001
Herbest, T. R., Jr., Feb., 1936, The
Consolidated Expanded Metal Company,
Wheeling, West Virginia. (V.F. 66)

Blueprints show design of mesh groins (referred to in article as
jetties) constructed of steel. Permeable groins consist of 9-foot
sections, 10 inches in diameter. The blueprints are pilot plans for
a project at Wheeling, West Virginia.

Key Words - Low/Steel/Permeable/N. Atlantic/1900-1949/Structural-
design/Const-procedure/Misc-materials/Adjustable/

"Round-Table Discussion" 3604GR0001
Anonymous, Shore and Beach, American Shore and
Beach Preservation Assoc., Vol. 4, No. 2,
Apr., 1936, pp. 55-56. (TC330. Am3)

Permeable steel groins are discussed in regard to construction,
abrasion and corrosion, and performance.

Key Words - S. Atlantic/Concrete/Steel/Const-problems/Scour/System/
Permeable/

"Jacob Riis Park"

3604GR0002

Anonymous, Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 6,
No. 2, Apr., 1936, pp. 64-65. (TC330 .Am3)

A system of 24 groins was constructed, and attached to a bulkhead. The groins have been effective in preventing material changes, but their impounding capacity is practically exhausted. Further steps for beach protection are provided. One of these, groin extension, is evaluated.

Key Words - N. Atlantic/System/Economics/ERosion/1900-1949/

"Galveston Beach Construction"

3604GR0003

Anonymous, Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 4,
No. 2, Apr., 1936, p. 66. (TC330 .Am3)

Initial plans and costs for a 10-element groin system near Galveston, Texas, are given.

Key Words - Texas Gulf/System/Economics/Misc-plan/

"Some Data on Beach Protection Works"

3605GR0001

Lipp, M. N., Civil Engineering, ASCE, Vol. 6,
No. 5, May, 1936, pp. 291-295.

Describes various types of shore protection works. Deterioration of shore protection works along the Florida East Coast between Miami Beach and Palm Beach is reviewed. Included are granite jetties, bulkheads, and groins made of concrete, steel, and treated and untreated timber.

Key Words - Concrete/Steel/Timber/S. Atlantic/System/Rubble-mound/
Structural-design/

"Participation of Federal Relief Agencies
in Beach Protection Projects"

3607GR0001

Thompson, S. G., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 4,
No. 3, July, 1936, pp. 89-92. (TC330 .Am3)

Plans and costs of a groin system are presented for a section of the Georgia coastline.

"Investigations of Steel Sheet Piling"

3607GR0002

Rhodes, R. F., U. S. Army Corps of Engineers,
Savannah District, Report to Beach Erosion
Board, Unpublished, July, 1936, 59 pp.
(TC685 .U5)

Report gives detailed data on the condition of sheet steel piling protection structures, including groins, constructed along the Florida coast. Design criteria and photographic coverage are included.

Key Words - Piling/Steel/S. Atlantic/Photographic/System/Short/High/
Long/Low/Structural-design/Field/Const-problems/
1900-1949/Impermeable/

"California's Beach Erosion and Development Problems"

3610GR0001

Leeds, C. T., Shore and Beach, American Shore
and Beach Preservation Assoc., Vol. 4, No. 4,
Oct., 1936, pp. 162-169. (TC330 .Am3)

Presented is a summary of the types of groins constructed along California's coastline. The author stresses that groin direction should be governed by prevailing wind direction.

Key Words - California/Timber/Short/High/Accretion/Erosion/Steel/Low/
Concrete/Structural-design/Const-problems/Impermeable/

"Construction and Maintenance of the Public Beach at Rockaway Beach, Borough of Queens"

3610GR0002

Steiner, C. T., The Municipal Engineers Journal, Paper 181, Oct., 1936, pp. 107-122.
(V.F. 3079)

To preserve the beach at Rockaway, it was realized that a comprehensive system of defense was necessary. Information gained from studies of the beach indicated that groins should be spaced about the same distance apart as their lengths, and a beach with about one-half this length could be maintained. Construction and design, cost, and success of groins as well as other protective structures are discussed.

Key Words - N. Atlantic/System/1900-1949/Structural-design/
Impermeable/Permeable/Economics/Field/Low/Erosion/
Accretion/Timber/Const-procedure/Const-problems/
Maintenance

"Report of the Foreshore Erosion Board" 3612GR0001
Green, H. J., ed., Dec., 1936, Government
Printer, Melbourne, Australia. (V.F. 1341)

A comprehensive report on the problem of erosion in the vicinity
of Port Phillip, Australia, this paper contains a section on groins
dealing with their purpose, design, and construction.

Key Words - Australia/Accretion/Erosion/Concrete/Timber/Rubble-mound/
Scour/Permeable/Impermeable/Low/1900-1949/

"Beach Erosion at Manasquan Inlet, N. J., 3701GR0001
and Adjacent Beaches"
U. S. Army Corps of Engineers, House Document
No. 71, 75th Congress, 1st Session, Jan.,
1937.

Key Words - House Document/Not Annotated/

"Coast Protection on the North Sea Coasts of 3703GR0001
Holland, France, Belgium and Germany"
van der Burgt, J. H., The Royal Engineers
Journal, The Institution of Royal Engineers,
Chatham, England, Mar., 1937, 13 pp.
(V.F. 1311)

Groins on the North Sea have in the past been built with materials
found close-at-hand and without understanding the purpose served by
each component part of the protective work. Design of existing groins,
and other protective structures, failure of designs, and a design
proposal for groins are presented.

Key Words - Europe/Erosion/Structural-design/Impermeable/Permeable/
Piling/Rubble-mound/Shoaling/Misc-materials/Field/

"Beach Erosion at Hollywood Beach, Fla." 3705GR0001

U. S. Army Corps of Engineers, House Document
No. 253, 75th Congress, 1st Session, May,
1937.

Key Words - House Document/Not Annotated/

"Round-Table Discussion of Shore Problems in
Relation to Recreation" 3710GR0001
Anonymous, Shore and Beach, American Shore
and Beach Preservation Assoc., Vol. 5, No. 4,
Oct., 1937, pp. 129-140. (TC330 .Am3)

Groin construction and effectiveness are presented. A discussion
of permeable groins compared with low groins is given.

Key Words - Texas Gulf/System/Steel/Accretion/Long/Erosion/Permeable/
Impermeable/Low/Piling/

"Jetty" 3711GR0001
Wood, S. M., U. S. Patent Office, Patent
No. 2,099,249, Nov., 1937, 3 pp.

This patent presents an S. M. Wood groin design particularly
adapted for ocean front protection, which offers permeability, and
facilitates easy installation.

Key Words - Patent/Structural-design/Concrete/Timber/Piling/
Permeable/Const-procedure/Scour/Accretion/

"Study of an Artificial Bathing Beach at
Orchard Beach, Pelham Bay, N. Y." 3711GR0002
U. S. Army Corps of Engineers, House
Document No. 450, 75th Congress, 2nd Session,
Nov., 1937.

Key Words - House Document/Not Annotated/

"Report on Beach Erosion at Hollywood Beach,
Florida" 3801GR0001
Anonymous, Shore and Beach, American Shore and
Beach Preservation Assoc., Vol. 6, No. 1,
Jan., 1938, pp. 9-13. (TC330 .Am3)

A short statement giving 1938 conditions of a groin system built in 1927 and 1935 at Hollywood Beach, Florida, is presented with proposed future improvement recommendations and costs.

Key Words - 1900-1949/S. Atlantic/System/Timber/Economics/Steel/Piling/
Structural-design/Misc-plan/Impermeable/

"Report on Erosion at Manasquan Inlet, New Jersey, and Adjacent Beaches" 3801GR0002
Anonymous, Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 6, No. 1, Jan., 1938, pp. 13-18. (TC330 .Am3)

An example of a single steel sheet-pile groin constructed (1933) to check erosion is briefly noted. Recommendations were made for further groin construction.

Key Words - 1900-1949/Erosion/Single/Field/System/Economics/
N. Atlantic/Accretion/Impermeable/

"Beach Erosion at Willoughby Spit, Va." 3801GR0003
U. S. Army Corps of Engineers, House Document No. 482, 75th Congress, 3rd Session, Jan., 1938.

Key Words - House Document/Not Annotated/

"Beach Erosion at Santa Barbara, Calif." 3803GR0001
U. S. Army Corps of Engineers, House Document No. 552, 75th Congress, 3rd Session, Mar., 1938.

Key Words - House Document/Not Annotated/

"Erosion of Our Coastal Frontiers" 3804GR0001
Wood, S. M., Bulletin of the Associated State Engineering Societies, Apr., 1938, 32 pp. (TC330 .W879)

Design criteria and the effects gained are discussed in relation to permeable and impermeable groins. Field examples are given.

Key Words - Impermeable/Permeable/S. M. Wood/S. Atlantic/Great Lakes/
Accretion/Scour/High/Low/Misc-plan/System/Concrete/Timber/
N. Atlantic/Erosion/Long/Short/Theory/Field/

"Shore Protective Work at Winthrop,
Massachusetts"

3806GR0001

Hale, R. K., Civil Engineering, ASCE, Vol. 8,
No. 6, June, 1938, pp. 388-399. (TA1 .C582)

Article describes the seawall and groin system in use at Winthrop, Mass. since 1915. In 1938, neither the timber groins nor the concrete seawall had shown signs of deterioration. Other structures added to the original system since 1915 are described and the estimate advanced that 160,000 sq. ft. of beach area has been added since the construction of protective structures.

Key Words - Timber/Low/Accretion/N. Atlantic/Structural-design/
Field/1900-1949/

"Early Attempts at Inlet Construction on the
Florida East Coast"

3807GR0001

Fineren, W. W., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 6,
No. 3, July, 1938, p. 91. (TC330 .Am3)

Writer believes there is insufficient information with respect to the relation of groin length to width and spacing that will lead to permanency of protection, but he believes that in general, groins should be spaced closer than is the general practice. A Florida example is given.

Key Words - S. Atlantic/Short/System/Erosion/Accretion/Rubble-mound/
Misc-plan/Economics/

"Galveston Island Shoreline and the Protection
of Galveston Beach"

3807GR0002

Washington, C. C., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 6,
No. 3, July, 1938, pp. 105-108. (TC330 .Am3)

Erosion Board recommendations are given which include groin concentration, length, spacing, design, and cost.

Key Words - Texas Gulf/System/Steel/Low/Economics/Structural-design/
Impermeable/

"Shore Protective Work at Winthrop,
Massachusetts"

3807GR0003

Hale, R. K., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 6, No. 3, July, 1938, pp. 92-94. (TC330 .Am3)

This article describes the seawall and groin system in use at Winthrop, Mass. since 1915. In 1938, neither timber groins nor concrete seawall showed signs of deterioration. Other structures added to the original system since 1915 are described and the estimate advanced that 160,000 sq. ft. of beach area has been added since the advent of beach protection.

Key Words - Timber/Accretion/N. Atlantic/Field/1900-1949/Structural-design/Low/Impermeable/

"Shorewood Protects Its Lake Front"

3807GR0004

Schmitt, H. A., The Municipality, League of Wisconsin Municipalities, July, 1938, pp. 143, 146. (V.F. 3080 12/38)

Previous groin construction and new construction of permeable groins, their cost, design, and construction procedure is discussed.

Key Words - Great Lakes/Economics/Scour/Erosion/1900-1949/Timber/Permeable/High/Long/Concrete/System/Field/Const-procedure/Structural-design/

"Protecting Galveston Beach"

3807GR0005

Washington, D. C., Civil Engineering, ASCE, Vol. 8, No. 7, July, 1938, pp. 461-462. (TA1 .C582)

Length, spacing, cost, and structural design of a groin system and accompanying seawall are given for the protection of Galveston's shoreline.

Key Words - Single/Timber/System/Economics/Artificial-fill/Steel/Impermeable/1900-1949/Texas Gulf/Structural-design/Misc-plan/Field/

"Shore Erosion and Cabbage Palmetto Groins at North Point, St. Augustine, Florida"

3811GR0001

Watkins, L. H., Nov., 1938, U. S. Army Corps of Engineers, Jacksonville District, Unpublished Report. (V.F. 3093a)

A letter and photographic review of erosion at North Point, Florida shows marked recession of the coastline that has accelerated since 1935. Four cabbage palmetto (timber) groins were constructed in July 1938. Subsequent investigations showed that the groins had no effect in preventing or retarding shore erosion.

Key Words - S. Atlantic/Field/Timber/Erosion/Misc-plan/Concrete/
Accretion/Impermeable/1900-1949/Photographic/Piling/
High/

"Effectiveness of Groins at Rockaway Beach,
Long Island, New York" 3812GR0001

Hyde, J. F. C., Dec., 1938, U. S. Army Corps
of Engineers, New York District, Unpublished
Report. (V.F. 3081 12/38)

This letter to the Beach Erosion Board evaluates the performance
and cost of permeable groin extension work on groins at Rockaway Beach,
New York.

Key Words - Maintenance/Economics/1900-1949/N. Atlantic/Impermeable/
Piling/Permeable/Timber/S. M. Wood/Accretion/Scour/Erosion/
Field/

"Beach Erosion Studies" 3901GR0001

Brown, E. I., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 7,
No. 1, Jan., 1939, pp. 3-23. (TC330 .Am3)

Design criteria of groins is discussed in detail. The author
recommends low, impermeable groins. Examples of systems at Palm Beach
and St. Augustine and their effects are given.

Key Words - Structural-design/Piling/Accretion/Artificial-fill/
Impermeable/Low/S. Atlantic/Steel/Timber/Rubble-mound/
Scour/Permeable/System/Terminal/1900-1949/

"Shore Protection by Permeable Groins" 3907GR0001

Boase, A. J., Shore and Beach, American Shore
and Beach Preservation Assoc., Vol. 7, No. 3,
July, 1939, pp. 105-108.

Permeable S. M. Wood and Concrete pile groins are described with
examples given from the Great Lakes. Groin construction and manufacture
of concrete blocks are presented in detail along with a section on

merits of permeable groins.

Key Words - Permeable/Great Lakes/Scour/Erosion/Low/Concrete/Piling/
S. M. Wood/System/Structural-design/Economics/

"Effectiveness of Permeable Type Groins Used
for Beach Protection at Shorewood, Wisc. and
Other Cities Along the West Shore of Lake
Michigan" 3911GR0001
Holcombe, W. H., Nov., 1939, U. S. Army Corps of
Engineers, Milwaukee, Wisconsin, Unpublished
Report. (V.F. 3080 12/38)

Two letters and photographs review 1939 conditions and effectiveness
of permeable groins on Lake Michigan.

Key Words - Great Lakes/Misc-plan/Structural-design/Permeable/System/
1900-1949/Steel/Piling/Concrete/Timber/Impermeable/Long/
Short/High/Rubble-mound/Field/

"Erosion and Palmetto Groins at North Point,
St. Augustine, Florida" 3912GR0001
Simkins, T. D., Dec., 1939, U. S. Army Corps
of Engineers, Jacksonville District,
Unpublished Report. (V.F. 3093b)

Letters and photographs give the history of erosion at North Point,
where the North Point, St. Augustine shore has been receding since 1935.
Four cabbage palmetto (timber) groins constructed in 1937 and a stone
groin built in 1889 are evaluated.

Key Words - S. Atlantic/Photographic/1900-1949/Low/Impermeable/High/
Timber/Erosion/Field/Single/System/Concrete/Piling/

"Beach Erosion Studies" 4000GR0001
Brown, E. I., Transactions of the American
Society of Civil Engineers, Vol. 105, 1940,
pp. 869-918

Items of information considered necessary in a comprehensive beach
erosion study, the reasons for desiring each particular item, and some
general observations on design of protective works are offered. The
presentation is made for two reasons: (1) that engineers interested in
beach protection may have the advantage of experience gained by the

Beach Erosion Board about factors involved in a study of beach erosion; and (2) that the items of information now believed best suited to the purpose by the Board may be subject to full and free discussion by all engineers interested.

Key Words - Erosion/Field/Concrete/Steel/California/Misc-plan/Notched/
Impermeable/

"Beach Erosion Studies"

4000GR0002

Brown, E. I., Transactions of the American Society of Civil Engineers, Vol. 105, Paper No. 2076, 1940, pp. 869-918.

Groin protection is recommended where storm waves of ordinary magnitude occur and where the adjoining land is of low relief. Design criteria of groins are discussed.

Key Words - Structural-design/Artificial-fill/Timber/Piling/Impermeable/
Misc-plan/System/

"The Prevention of Coast Erosion"

4000GR0003

Du-Plat-Taylor, F.M.G., Journal of the Institution of Civil Engineers, London, Vol. 15, 1940-1941, pp. 53-60.

Measures to stop erosion, including seawalls, groins, and vegetation are discussed. Author gives data concerning the design, setting, and legal aspects of groin construction.

Key Words - Du-Plat-Taylor/Adjustable/Timber/Low/High/Concrete/Rubble-mound/Misc-plan/Legal/Europe/

"Permeable Groins at Kenosha, Wisconsin"

4001GR0001

Holcombe, W. H., Jan., 1940, U. S. Army Corps of Engineers, Milwaukee, Wisconsin, Unpublished Report. (V.F. 3080 12/39)

Letters to the Beach Erosion Board evaluate permeable groin construction and its effectiveness as a shore protection method on the Lake Michigan shore at Kenosha, Wisconsin.

Key Words - Long/Short/Permeable/Great Lakes/1900-1949/Piling/Concrete/Scour/Impermeable/Rubble-mound/Erosion/Accretion/S. M. Wood/Field/

"Curved Jetties, Sea Walls, Bulkheads and Retaining Walls"

4001GR0002

Milliken, F., Milliken Method of Preventing the Erosion of Shore Fronts, and at the Same Time Building Out the Beach Making Nature Work Against Itself, Brochure, Published by F. Milliken, 44 West 44th St., New York, Jan., 1940, 3 pp. (V.F. 3105)

A type of groin-like structure is discussed. Design sketches patented by Milliken are given. However, no examples of practical applications or tests are provided.

Key Words - Theory/Milliken/Accretion/Erosion/Structural-design/

"Hawk's Nest Beach, Connecticut"

4001GR0003

Anonymous, Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 8, No. 1, Jan., 1940, pp. 14-19. (TC330 .Am3)

As part of a beach protection scheme at Hawk's Nest Beach, Connecticut, the U. S. Army Beach Erosion Board recommended that six rubble-mound groins be built. History of erosion and previously constructed protective structures is given.

Key Words - Impermeable/Artificial-fill/Rubble-mound/System/Economics/
Timber Erosion/Accretion/Misc-plan/1900-1949/N. Atlantic/

"Beach Erosion Study, Orange County, Calif."

4002GR0001

U. S. Army Corps of Engineers, House Document No. 637, 76th Congress, 3rd Session, Feb., 1940.

Key Words - House Document/Not Annotated/

"Report on Shore Erosion at Tilghman Point, Md."

4006GR0001

Dent, E. J., July, 1940, 7 pp., Unpublished Manuscript. (V.F. 1813)

Report describes the extent of erosion at Tilghman Point, and proposes, as one measure, that inexpensive rip-rap groins be used to retard erosion.

Key Words - Rubble-mound/N. Atlantic/System/Erosion/Accretion/
Impermeable/

"Erosion Control at Wrightsville Beach"
Brown, E. I., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
8, No. 4, Oct., 1940, pp. 123-124

4010GR0001

Hydraulic fill and a groin system were planned for an erosion control project at Wrightsville Beach, North Carolina. Design specifications, cost, and construction procedures are presented.

Key Words - Economics/S. Atlantic/Artificial-fill/Timber/Structural-
design/Piling/1900-1949/Const-procedures/Impermeable/

"Beach Erosion Study, St. Simon Island, Ga."
U. S. Army Corps of Engineers; House Document
No. 820, 76th Congress, 3rd Session, June 1940.

4010GR0002

Key Words - House Document/Not Annotated/

"Report on St. Simon Island Studies"
Anonymous, Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 9,
No. 1, Jan., 1941, pp. 18-23, 26-28.
(TC330 .Am3)

4101GR0001

The U. S. Army Beach Erosion Board recommended three plans for the protection of St. Simons Island, Georgia. All three plans included the construction of groins; singly and in a system, permeable and impermeable. Overall plans, projected effects, and the cost of each plan are given.

Key Words - S. Atlantic/Artificial-fill/Economics/Steel/Impermeable/
Timber/Permeable/Single/System/Misc-plan/Piling/1900-1949/

"The Prevention of Coast Erosion"
Du-Plat-Taylor, F. M. G., The Dock and Harbour
Authority, London, Vol. 21, No. 241, Apr.,
1941, pp. 125-127. (TC1 .D6)

4104GR0001

Author discusses seawalls and groins, and states that seawalls can be successful only where the beach is maintained by groins. Design and maintenance of groins is discussed.

Key Words - Europe/Concrete/Timber/High/Low/Adjustable/Erosion/System/
Structural-design/Maintenance/Impermeable/

"Coast Erosion"

4110GR0001

Keay, T. B., The Dock and Harbour Authority,
London, Vol. 21, No. 252, Oct., 1941,
pp. 241-245.

This article was written because of increasing concern with coastal erosion in Great Britain. It discusses the preferred design, use, and spacing of groins, and the design and effectiveness of other types of protective structures.

Key Words - System/High/Low/Misc-plan/Timber/Europe/Structural-design/
Long/Concrete/Du-Plat-Taylor/Adjustable/1900-1949/
Impermeable/Erosion/

"Beach Erosion Study, Coronado, Calif."

4202GR0001

U. S. Army Corps of Engineers, House
Document No. 636, 77th Congress, 2nd Session,
Feb., 1942.

Key Words - House Document/Not Annotated/

"Coast Erosion in Great Britain"

4204GR0001

Keay, T. B., Shore and Beach, American Shore
and Beach Preservation Assoc., Vol. 10, No. 1,
Apr., 1942, pp. 3-5, 22-25. (TC330 .Am3)

Groin systems, different types of designs and use are discussed along with other types of shore protection structures.

Key Words - Europe/Terminal/System/High/Low/Misc-plan/Long/Concrete/
Impermeable/Permeable/Case/Du-Plat/Taylor/Timber/Adjustable/
Misc-materials/Structural-design/1900-1949/

"Beach Protection Measures"

4206GR0001

Hall, W. C., The Military Engineer, Society
of American Military Engineers, Vol. 34,
No. 200, June, 1942, pp. 292-296.

Various types of shore protection structures, including groins, are reviewed. Different designs, their effects, and field examples are given.

Key Words - Artificial-fill/Low/System/High/Long/Impermeable/Misc-plan/
L-groins/T-groins/Steel/Piling/Permeable/Great Lakes/
California/S. Atlantic/N. Atlantic/Scour/Field/

"Beach Protection Measures"

4210GR0001

Hall, W. C., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 10, No. 2, Oct., 1942, pp. 60-64. (TC330 .Am3)

The function, design, and application of groins and other protective works are discussed. Examples are cited.

Key Words - High/Low/T-groins/L-groins/Steel/Piling/Scour/Permeable/
Great Lakes/Impermeable/Structural-design/Theory/
California/S. Atlantic/

"The Relation of the Action of Waves and Currents on Headlands to the Control of Shore Erosion by Groins"

4300GR0001

Evans, O. F., Proceedings of the Oklahoma Academy of Science, 1943, pp. 9-13.

Contrary to general opinion, the author believes that beach drifting is a more important source of sediment transportation by waves and currents than are littoral currents. Groins are discussed and improvements are noted. A permeable groin is suggested which eliminates the need for expensive preliminary surveys.

Key Words - Erosion/High/Low/Misc-plan/Permeable/Impermeable/Accretion/
Great Lakes/

"Niagara County, N. Y., Beach Erosion Study"

4308GR0001

U. S. Army Corps of Engineers, House Document No. 271, 78th Congress, 1st Session, Aug., 1943.

Key Words - House Document/Not Annotated/

"Erosion of Our Coastal Frontiers - Part II"

4405GR0001

Wood, S. M., The Illinois Engineer, Illinois Society of Engineers, Inc., Vol. 20, No. 5, May, 1944, pp. 5-34. (TC330 .W879)

Pictorial article relies upon photography showing "before and after" conditions where groins of recent type have been installed. Discussion is related to both ocean and Great Lakes riparian studies. Structural criteria of groins and the effects of artificial interference of the littoral drift are discussed.

Key Words - S. M. Wood/System/N. Atlantic/Great Lakes/Permeable/
Concrete/ Impermeable/Timber/S. Atlantic/Field/
Photographic/Long/Short/

"Steel Sheet Piling for Shore and Beach
Protection Structures"

4410GR0001

McIntosh, R. J., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
12, No. 2, Oct., 1944, pp. 49-52.
(TC330 .Am3)

Steel sheet piling is discussed as used in beach protection structures. The author commences with a discussion of the cross section, carbon content and tensile strength of pilings used; explains method of driving, lists advantages and disadvantages of steel piling, and discusses steel corrosion.

Key Words - Steel/Const-procedure/Rubble-mound/Structural-design/
Piling/Misc-plan/Timber/Const-problems/Europe/
California/Asia/N. Atlantic/S. Atlantic/Impermeable/

"Shore Protection Methods and Materials"

4410GR0002

Kingman, J. J., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
12, No. 2, Oct., 1944, pp. 27-30.
(TC330 .Am3)

Methods and materials for shore protection are discussed by General John J. Kingman, former senior member of the Beach Erosion Board. A review of groins, their design, and the author's own design preferences are presented. Examples of groin projects are given.

Key Words - System/Piling/Concrete/Timber/Rubble-mound/Low/Long/
Short/High/Europe/California/Structural-design/Const-
problems/Mobbs/1900-1949/

"Concrete Shore Protection Structures"

4410GR0003

Corning, L. H., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
12, No. 2, Oct. 1944, pp. 45-48. (TC330 .Am3)

Permeable groins made of concrete, their design criteria, and examples of shore protection projects are given.

Key Words - Permeable/Concrete/Accretion/Great Lakes/S. Atlantic/
Field/1900-1949/

"Problems of Island and Coast Protection" 4500GR0001
Kramer, J., Report of West Germany Water
Economy Association, 1945, pp. 115-133.

Key Words - Not Annotated/

"Beach Erosion Study, Lake Erie Shore 45050001
Line in the Vicinity of Huron, Ohio"
U. S. Army Corps of Engineers, House
Document No. 220, 79th Congress, 1st
Session, May 1945.

Key Words - House Document/Not Annotated/

"Beach Erosion Study, Ohio Shore Line of 4505GR0002
Lake Erie from Ohio-Michigan State Line
to Marglehead, Ohio"
U. S. Army Corps of Engineers, House
Document No. 177, 79th Congress, 1st
Session, May, 1945.

Key Words - House Document/Not Annotated/

"Permeable Jetties Built to Protect 4507GR0001
Cleveland's Shore"
Anonymous, Engineering News-Record,
McGraw-Hill Pub. Co., Vol. 135, No. 2,
July, 1945, p. 89.

Illustrations and details of patented precast concrete groins
are presented.

Key Words - Great Lakes/Permeable/Concrete/Const-procedure/Structural-
design/

"Art of Beach Protection"

4510GR0001

Wood, S. M., U. S. Patent Office,
Patent No. 2,387,965, Oct., 1945,
3 pp.

An S. M. Wood groin design constructed with timber, steel, concrete or any combination thereof is presented by this patent.

Key Words - Patent/Structural-design/Erosion/Great Lakes/Scour/
Permeable/Piling/Steel/Concrete/Timber/Const-
procedure/

"Report on the Use of Asphalt at Groin
Construction in Delftland (Holland)"
Peters, A. G., Transactions of Poly-
technic Institute, No. 49/50, 1946.

4600GR0001

Key Words - Not Annotated/

"Some Sea Defence Works for Reclaimed
Lands"
Dobbie, C. H., Journal of the Institu-
tion of Civil Engineers, London, Vol.
22, No. 4, Feb., 1946, pp. 267-272.
(TC345'.G7D65)

4602GR0001

Usually a silent topic, the author presents a discussion on the terminal groin of a system. Until a solution is devised that will end the scour of the terminal groin, it is suggested that permeable lateral works, wave screens, faggoting, and groins (as low as possible) be employed to keep erosion at a minimum. Faggot-work groins, used to reduce irregularities caused by groins in shingle banks, are given special attention.

Key Words - System/Timber/Misc-plan/Piling/Terminal/Europe/
Structural-design/Permeable/Impermeable/Low/

"Piers and Jetties of Precast Concrete"
Lathrop, S. P., Rock Products, Vol. 49,
No. 2, Chicago, Illinois, Feb., 1946,
pp. 136-137.

4602GR0002

Construction of five permeable groins at Evanston, Illinois on Lake Michigan is presented in this commercial review. The groins, designed after S. M. Wood, were constructed with precast concrete blocks and anchored by piling. Specific construction procedures and a structural-design are given.

Key Words - Great Lakes/S. M. Wood/Erosion/Accretion/Concrete/
Permeable/Structural-design/High/Const-procedure/

"Beach Erosion Study, Lake Michigan
Shoreline of Milwaukee County, Wis."
U. S. Army Corps of Engineers, House
Document No. 526, 79th Congress, 1st
Session, Apr., 1946.

4604GR0001

Key Words - House Document/Not Annotated/

"Beach Erosion Study of Bakers Haulover
Inlet, Fla."
U. S. Army Corps of Engineers, House
Document No. 527, 79th Congress, 2nd
Session, Apr., 1946.

4604GR0002

Key Words - House Document/Not Annotated/

"The Problem of Coast Erosion"

4700GR0001

Duvivier, J., Journal of the Institution of Civil Engineers, London, 1947, 47 pp.
(TC257 .D2)

Included is a section giving the author's views on groin design and construction. Economics and effectiveness of the structure are discussed. Author's views are based on personal observations, and application of his designs to actual shore protection projects, examples of which are cited.

Key Words - Erosion/Europe/Timber/Piling/Adjustable/High/Scour/Low/
Maintenance/Shore/Misc-plan/Economics/Misc-materials/
Structural-design/Const-procedure/Field/Theory/
Impermeable/Long/Accretion/1900-1949/

"Experimental Steel Sheet Pile Groins, Palm Beach, Florida"

4800GR0001

Ross, C. W., U. S. Army Beach Erosion Board, Technical Memorandum, No. 10, 1948, 30 pp.
(BEB T.M. 10)

Five experimental steel pile groins were constructed on the Atlantic Coast at Palm Beach, Florida. Steel was donated by five steel companies, designs made by the Beach Erosion Board, and construction by the city of Palm Beach. Observations regarding deterioration of steel and protective coatings were made over a period of 10 years, with reports and general conclusions presented regarding useful life of steel sheet piling. Measured and observed data are tabulated.

Key Words - Field/Steel/S. Atlantic/Experimental/System/Const-problems/
Structural-design/1900-1949/Impermeable/

"Recent Storm Damage Along the Coasts of Florida and Mississippi"

4801GR0001

Anonymous, U. S. Army Beach Erosion Board Bulletin, Vol. 2, No. 1, Jan., 1948, pp. 3-4.
(BEB Vol. 2, No. 1)

A photograph in article shows a groin (at Palm Beach) flanked by a storm, and illustrates the necessity of such structures being backed by a bulkhead to protect against hurricanes.

Key Words - Erosion/Texas Gulf/S. Atlantic/Single/Impermeable/

"The Action of Groins on Beach
Stabilization"

4804GR0001

Johnson, J. W., University of California, Dept.
of Engineering, Navy Dept. Bureau of Ships
Contract NObs 2490, Technical Report HE-116-283,
Apr., 1948. (V.F. 1090 HE-116-283)

The purpose of this investigation, made at the request of the
Beach Erosion Board, was to obtain information on the comparative
action of permeable and impermeable groins presently employed to
promote accretion and stabilization of beaches where littoral transport
induced by wave action is a significant factor.

Key Words - Theory/Experimental/Photographic/Permeable/Impermeable/
Accretion/Erosion/High/Low/Scour/Single/1900-1949/

"Harrison County, Miss., Beach Erosion
Control Study"

4805GR0001

U. S. Army Corps of Engineers, House Document
No. 682, 80th Congress, 2nd Session, May, 1948.

Key Words - House Document/Not Annotated/

"Paper on Protective Works Adopted to Limit
Erosion Along the Open Coast: How They Work"
Frech, F. F., U. S. Army Corps of Engineers,
Philadelphia District, June, 1948, 35 pp.,
Unpublished Report. (TC330 .Fr48)

4806GR0001

Shore protective structures, including groins, along the New Jersey
coast are discussed and evaluated. New designs are offered where shore
conditions warrant special structures.

Key Words - N. Atlantic/Field/Piling/Timber/Rubble-mound/Single/Economics/
Accretion/Structural-design/Const-problems/Erosion/Long/High/
Short/Low/System/T-groins/Steel/Impermeable/1900-1949/
Maintenance

"Wave Action on Beaches"

4806GR0002

Jones, J. H., M. S. Thesis, June, 1948, Univ.
of California, 24 pp., Unpublished.
(GC211 .J77)

The purpose of this investigation was to study effects of groins on
wave-induced longshore currents. Studies of the effects of several types

of groins on wave action, littoral sand transport, and underwater topography in the vicinity of each structure were made. The study was largely comparative, and only the relative changes effected by each type of groin were investigated.

Key Words - Model/Photographic/Erosion/Accretion/Permeable/Impermeable/
High/Low/Scour/

"North Carolina Shoreline, Beach Erosion Study" 4812GR0001
U. S. Army Corps of Engineers, House Document
No. 763, 80th Congress, 2nd Session, Dec.,
1948.

Key Words - House Document/Not Annotated/

"Punta Las Marias, San Juan, P. R., Beach 4812GR0002
Erosion Control Study"
U. S. Army Corps of Engineers, House Document
No. 769, 80th Congress, 2nd Session, Dec.,
1948.

Key Words - House Document/Not Annotated/

"Winthrop Beach, Mass., Beach Erosion Control 4812GR0003
Study"
U. S. Army Corps of Engineers, House Document
No. 764, 80th Congress, 2nd Session, Dec.,
1948.

Key Words - House Document/Not Annotated/

"Anna Maria and Longboat Keys, Fla., Beach 4812GR0004
Erosion Study"
U. S. Army Corps of Engineers, House Document
No. 760, 80th Congress, 2nd Session, Dec.,
1948.

Key Words - House Document/Not Annotated/

"Palm Beach, Fla., Beach Erosion Study" 4812GR0005
U. S. Army Corps of Engineers, House Document

No. 772, 80th Congress, 2nd Session, Dec., 1948.

Key Words - House Document/Not Annotated/

"Santa Barbara, Calif. Beach Erosion Control Study" 4812GR0006

U. S. Army Corps of Engineers, House Document
No. 761, 80th Congress, 2nd Session, Dec., 1948.

Key Words - House Document/Not Annotated/

"Jupiter Island Fla., Beach Erosion Study" 4812GR0007

U. S. Army Corps of Engineers, House Document
No. 765, 80th Congress, 2nd Session, Dec., 1948.

Key Words - House Document/Not Annotated/

"Report to the Seventeenth International Navigation Congress" 4900GR0001

Abecasis, C. K., Seventeenth International Navigation Congress, Permanent International Association of Navigation Congresses, Brussels, Belgium, Section 2 - Ocean Navigation, Communication 1, 1949, 11 pp. (TC5 .In8r)

A general discussion of the theory of groin purpose as dependent upon design criteria is presented.

Key Words - Terminal/Misc-plan/Low/Timber/Steel/Piling/Concrete/Europe/
Theory/Rubble-mound/T-groins/Accretion/System/

"Report to the Seventeenth International Navigation Congress" 4900GR0002

Acena, V. C., Isla, A. G., and Vera, L. D.,
Seventeenth International Navigation Congress, Permanent International Association of Navigation Congresses, Brussels, Belgium, Section 2 - Ocean Navigation, Communication 1, 1949, pp. 21-44. (TC5 .In8r)

Key Words - Not Annotated/

"Report to the Seventeenth International
Navigation Congress"

4900GR0003

Frech, F. F., Seventeenth International
Navigation Congress, Permanent International
Association of Navigation Congresses,
Brussels, Belgium, Section 2 - Ocean
Navigation, Communication 1, 1949, pp. 45-62.
(TC5 .In8r)

Extensive construction of protective structures has ensued along a coastal resort area of New Jersey, an area subject to increasing amounts of erosion. Among the protective structures, groins are discussed in regard to design, effect, costs, with examples.

Key Words - N. Atlantic/Erosion/Timber/Rubble-mound/Misc-plan/Piling/
Economics/Structural-design/Impermeable/High/Long/Accretion/
1900-1949/Single/System/T-groins/

"Report to the Seventeenth International
Navigation Congress"

4900GR0004

Dobbie, C. H., Seventeenth International
Navigation Congress, Permanent International
Association of Navigation Congresses,
Brussels, Belgium, Section 2 - Ocean
Navigation, Communication 1, 1949, pp. 75-84.
(TC5 .In8r)

Effects of and essential design criteria of groins used in England are briefly reviewed.

Key Words - System/Scour/Erosion/Terminal/Permeable/Impermeable/Timber/
Adjustable/Steel/Mobbs/Europe/

"Report to the Seventeenth International
Navigation Congress"

4900GR0005

Duvivier, J., Seventeenth International
Navigation Congress, Permanent International
Association of Navigation Congresses,
Brussels, Belgium, Section 2 - Ocean
Navigation, Communication 1, 1949, pp. 85-103.

Author stresses that design criteria for shore protection structures, including groins, be preceded by careful field research. Various types of groins, their design, function, effect, and cost are discussed.

Key Words - Economics/Scour/Erosion/Europe/Misc-plan/Timber/Piling/Steel/
Concrete/High/Low/Long/Maintenance/Mobbs/Impermeable/Permeable/

"Report to the Seventeenth International Navigation Congress"
Viscentini, M., Pancini, G., and Teuschl, E., Seventeenth International Navigation Congress, Permanent International Association of Navigation Congresses, Brussels, Belgium, Section 2 - Ocean Navigation, Communication 1, 1949, pp. 105-134. (TC5 .In8r)

4900GR0006

Key Words - Not Annotated/

"Report to the Seventeenth International Navigation Congress"
Thierry, J. W., and van der Burgt, J. H., Seventeenth International Navigation Congress, Permanent International Association of Navigation Congresses, Brussels, Belgium, Section 2 - Ocean Navigation, Communication 1, 1949, pp. 135-156. (TC5 .In8r)

4900GR0007

Key Words - Not Annotated/

"Sea Transportation Structures III-B"
Agatz, A., Sea Structures, Land Conservation, 1949, pp. 1080-1083.

4900GR0008

Key Words - Not Annotated/

"Coast Protection"
Minikin, R. R., The Dock and Harbour Authority, Vol. 29, Nos. 337-342, Nov., 1948 - Apr., 1949, pp. 165-169, 193-198, 232-236, 251-256, 281-285, 311-314.

4904GR0001

This article, part of a continuing series in the journal, covers numerous types of shore protection measures, their design, and problems encountered. Groin design and effect are covered.

Key Words - Timber/Europe/Long/Low/Rubble-mound/Concrete/Structural-design/Misc-plan/System/Single/Short/Great Lakes/Case/Impermeable/Accretion/

"Colonial Beach, Va., Beach Erosion
Control Study"

4909GR0001

U. S. Army Corps of Engineers, House
Document No. 333, 81st Congress, 1st
Session, Sept., 1949.

Key Words - House Document/Not Annotated/

"Deterioration of Steel Sheet Pile Groins
at Palm Beach, Florida"
Ross, C. W., Corrosion, National Association
of Corrosion Engineers, Vol. 5, No. 10,
1949, pp. 339-341. (TA462 .C65)

4910GR0001

See entry 4800GR0001.

Key Words - Field/Steel/S. Atlantic/Experimental/System/Const-
problems/Structural-design/1900-1949/Impermeable/

"All Steel Groyne - Miami Beach"
Lipp, M. N., Shore and Beach, American Shore
and Beach Preservation Assoc., Vol. 17, No. 2,
Oct., 1949, pp. 6-7.

4910GR0002

An all-steel groin consisting of variable length 27-pound steel
sheet piling, steel channel wales and steel H piling was constructed
on Miami Beach. Construction procedure and design of groin are
given.

Key Words - Steel/Piling/Scour/S. Atlantic/Const-problems/Structural-
design/1900-1949/Low/Const-procedure/Legal/Single/
Impermeable/

"Planning Shore Protection"
Scott, T. A., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol. 17,
No. 2, Oct., 1949, pp. 8-9. (TC330 .Am3)

4910GR0003

The author briefly discusses effect of groins on sand movement.

Key Words - Accretion/N. Atlantic/

Brief discussions of groins are found throughout the text and deal mainly with deficiencies encountered in groin construction.

Key Words - Structural-design/High/Low/Accretion/Erosion/Scour/
Europe/Great Lakes/

"Origin and Decline of the Island Trischen"

5000GR0002

Wohleberg, E., Transactions of Geographic

Society, Hamburg, Vol. 49, 1950, pp. 158-187.

Key Words - Not Annotated/

"Coast Erosion"

5000GR0003

Minikin, R. R., The Dock and Harbour Authority,

London, Vol. 30, 31, 1950, pp. 305-308, 335-

339, 369-373, 17-25, 47-51, 91-94, 127-131.

Review of erosion of England's coastline and measures taken to protect shore are presented.

Key Words - Timber/Concrete/Low/High/Impermeable/Europe/Accretion/
Erosion/Case/Rubble-mound/Short/Long/1800-1900/1900-1949/
System/Piling/

"Area 1 - Ash Creek to Saugatuck River, Conn.,
Beach Erosion Control Study"

5001GR0001

U. S. Army Corps of Engineers, House Document

No. 454, 81st Congress, 2nd Session, Jan.,

1950.

Key Words - House Document/Not Annotated/

"Area 2 - Hammonasset River to East River,
Conn., Beach Erosion Control Study"

5002GR0001

U. S. Army Corps of Engineers, House Document

No. 474, 81st Congress, 2nd Session, Feb.,

1950.

Key Words - House Document/Not Annotated/

"South Shore, State of Rhode Island,
Beach Erosion Control Study" 5002GR0002
U. S. Army Corps of Engineers, House
Document No. 490, 81st Congress, 2nd Session,
Feb., 1950.

Key Words - House Document/Not Annotated/

"Atlantic City, N. J., Beach Erosion Control
Study" 5003GR0001
U. S. Army Corps of Engineers, House Docu-
ment No. 538, 81st Congress, 2nd Session,
Mar., 1950.

Key Words - House Document/Not Annotated/

"Cleveland and Lakewood, Ohio, Beach
Erosion Control Study" 5003GR0002
U. S. Army Corps of Engineers, House Docu-
ment No. 502, 81st Congress, 2nd Session,
Mar., 1950.

Key Words - House Document/Not Annotated/

"Appendix IX - Shore of Lake Erie in Lake
County, Ohio, Beach Erosion Control Study" 5005GR0001
U. S. Army Corps of Engineers, House Docu-
ment No. 596, 81st Congress, 2nd Session,
May, 1950.

Key Words - House Document/Not Annotated/

"Presque Isle Peninsula, Erie, Pennsylvania
Beach Erosion Control Study" 5005GR0002
U. S. Army Corps of Engineers, House Docu-
ment No. 397, 86th Congress, 2nd Session,
May, 1960.

"The Danish Westcoast: Littoral Drift
Problems and Measures Against Coast Erosion"
Bruun, P., The Dock and Harbour Authority,
London, Vol. 31, No. 359, Sept., 1950, pp.
163-167.

5008GR0001

Coastal protection structures, including groins, built on the west coast of Denmark are reviewed for the period from 1870 to 1950. The author gives an example of interest, noting that impermeable concrete-block groins have been sinking due to their great weight, and must be heightened periodically. Construction costs, structural design, and maintenance of structures are given.

Key Words - Europe/1900-1949/Timber/Piling/Rubble-mound/Concrete/
Erosion/Accretion/Structural-design/Economics/1950-1954/
Const-problems/Maintenance/Impermeable/System/

"Scattered Groins"
Bruun, P., Ingenioren, Denmark, Issue 38,
Sept., 1950, pp. 776-779. (Translation
available at CERC Library - TC535 .B6)

5009GR0001

Successful operation of groins depends on length and spacing of groins where impounded sediment will form a saw-toothed coast-line or a series of closed bays.

Key Words - Europe/Short/Low/System/California/Erosion/Field/Misc-
plan/Single/Impermeable/

"Design and Construction of Groins"
Horton, D. F., Proceedings of First Conference on Coastal Engineering, Council on Wave
Research of the Engineering Foundation, Oct.,
1950, pp. 246-253. (TC203 .C6)

5010GR0001

This paper is a digest on current design and construction practices concerning groin limitations, types, length and profile, spacing, and selection of type.

Key Words - Steel/Timber/Concrete/Rubble-mound/Structural-design/
Impermeable/High/Low/System/Misc-plan/Permeable/
Economics/

"Littoral Processes on Sandy Coasts"
Eaton, R. O., Proceedings of First Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1950, pp. 148-149. (TC203 .C6)

5010GR0002

In a section on man made littoral barriers, basic data regarding groins and their effect upon littoral transport are presented.

Key Words - Accretion/Erosion/Short/Long/1950-1954/

"Water Economy between North and Baltic Sea, Kiel"
Weinnoldt, E., and Suhr, H., 1951.

5100GR0001

Key Words - Not Annotated/

"Seagroins on Coasts with Weak Tides and Strong Sand Drift"
Burhorn, E., Planning and Building 5, No. 3, 1951, pp. 57-62.

5100GR0002

Key Words - Not Annotated/

"Application of Asphalt in Hydraulic Engineering Works"
van der Burgt, J. H., U. S. Army Beach Erosion Board Bulletin, Vol. 5, No. 1, Jan., 1951, pp. 25-64. (BEB Vol. 5, No. 1)

5101GR0001

Research and testing during construction of asphalt structures have led to good control of the properties of asphaltic bitumen and bituminous mixtures. Use of these products in protective shoreline structures, including groins, is outlined and evaluated.

Key Words - Asphalt/N. Pacific/Texas Gulf/Europe/Field/Single/System/Impermeable/Structural-design/

"Influence of Groins on Beach Stabilization"
Shay, E. A., and Johnson, J. W., University of California at Berkeley, Department of Engineering, Series 14, Issue 6, Beach Erosion Board Contract W49-055-eng-2, Jan.,

5101GR0002

Effect of impermeable and permeable groins was determined by comparing topography of a straight, unobstructed beach in equilibrium with a beach that had reached equilibrium after a system of groins had been installed. Model tests showed that permeable groins retained from 11% to 26% of the sand used in the experiment; far less effective than for impermeable groins. Dye tests were employed to trace the pattern of littoral movement through permeable groins.

Key Words - Laboratory/Model/Experimental/Permeable/Impermeable/
Erosion/Accretion/High/Low/System/Single/Photographic

"Revere Beach, Mass., Beach Erosion Control Study" 5105GR0001

U. S. Army Corps of Engineers, House Document No. 167, 82nd Congress, 1st Session, May, 1951.

Key Words - House Document/Not Annotated/

"Quincy Shore Beach, Mass., Beach Erosion Control Study" 5105GR0002

U. S. Army Corps of Engineers, House Document No. 145, 82nd Congress, 1st Session, May, 1951.

Key Words - House Document/Not Annotated/

"Revere Beach, Mass., Beach Erosion Control Study" 5105GR0003

U. S. Army Corps of Engineers, House Document No. 146, 82nd Congress, 1st Session, May, 1951.

Key Words - House Document/Not Annotated/

"Beach Protection Engineers Attempt to Outwit Nature at Presque Isle, Peninsula" 5109GR0001

Forney, F. H., and Lynde, G. A., Civil Engineering, ASCE, Vol. 21, No. 9, Sept.,

1951, pp. 28-31.

Since 1819 continuous projects have been underway to solve the problem of beach erosion along Presque Isle Peninsula, Pennsylvania. Protection measures, including groins and artificial fill, are reviewed.

Key Words - Erosion/Accretion/1800-1900/1900-1949/Steel/Piling/
Rubble-mound/Low/Long/Great Lakes/Impermeable/Field/
System/

"Underwater Longitudinal Works for Coastal Protection" 5200GR0001

Bomas, P., Wasserwirtschaft - Wassertechnik,
Berlin, Vol. 2, No. 5, 1952.

Key Words - Not Annotated/

Coast Erosion and Protection; Studies in Causes and Remedies 5200GR0002

Minikin, R. R., 1st ed., Chapman and Hall
Ltd., London, 1952, 240 pp. (TC330 1952)

An extensive part of this text deals with groins. Function, construction, length, spacing, orientation, and other considerations of design are presented with examples and illustrations.

Key Words - Timber/Misc-plan/ERosion/Accretion/Impermeable/High/Low/
Short/Long/System/Field/Concrete/Piling/Misc-materials/
Europe/Structural-design/Single/Great Lakes/Theory/Spur/

"Abbruch und Schutz der Steilufer an der Ostseeküste" 5200GR0003

Petersen, M., Die Küste, Kiel, West Germany
Vol. 1, No. 2, 1952, pp. 100-152. (GB4575
.K97)

Translated Title: "Breaking and Protection of Steep Shores of the Baltic Sea Coast"

Key Words - Not Annotated/

"Die Wirking der Buhne H in Wangerooge -
West auf das Seegat"
Lüders, K., Die Küste, Kiel, West Germany,
Vol. 1, No. 1, 1952, pp. 21-26. (GB457.5
.K97)

5200GR0004

Translated Title: "The Effect of Groin H in Wangerooge - West
...."

Key Words - Not Annotated/

"Die Ursachen der Abbrucherscheinungen am
West - und Nordweststrand der Insel Norderney"
Thilo, R., and Kurzak, G., Die Küste, Kiel,
West Germany, Vol. 1, No. 1, 1952, pp. 1-20.
(GB457.5 .K97)

5200GR0005

Translated Title: "Origin of Breaking Phenomena on West and
Northwest Beach of the Island of Norderney"

Key Words - Not Annotated/

"Gutachtliche Stellungnahme zu den
Untersuchungen über die Ursachen der
Abbrucherscheinungen am West - und Nord -
weststrand der Insel Norderney ..."

5200GR0006

Coastal Commission of North Sea and Baltic
Sea, Die Küste, Kiel, West Germany, Vol. 1,
No. 1, 1952, pp. 27-42. (GB457.5 .K97)

Translated Title: "Experts Report on Investigation Concerning
Reasons for Coastal Breaking Phenomena on West and North Part of
Norderney"

Key Words - Not Annotated/

"Asphalt Construction in Groin Building"
Kloss, Wosser und Boden, Hamburg, 4, No. 3,
1952, pp. 52-56.

5200GR0007

Key Words - Not Annotated/

"Summary Report on Studies of Sand Transportation by Wave Action"

5201GR0001

Anonymous, U. S. Army Beach Erosion Board Bulletin, Vol. 6, No. 1, Jan., 1952, pp. 3-6. (BEB Vol. 6, No. 1)

A model study was made of two types of groins: one, a sloping, impermeable groin; the second, a high, permeable groin. The investigation was designed to determine relative influence of the high permeable groins and the sloping impermeable groins for stabilizing a beach where littoral transport occurs. Among other conclusions it was found that permeable groins should not be used as individual units isolated along the beach, but rather in a system of groins.

Key Words - System/High/Permeable/Impermeable/Theory/Experimental/
Model/System/Single/Scour/Accretion/Erosion/1950-1954/
Misc-plan/

"Appendixes III, VII, and XII, Ohio Shore Line of Lake Erie between Fairport and Ashtabula, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 351, 82nd Congress, 2nd Session, Jan., 1952.

5201GR0002

Key Words - House Document/Not Annotated/

"Appendixes V and X, Ohio Shore Line of Lake Erie between Ashtabula and the Pennsylvania State Line, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 350, 82nd Congress, 2nd Session, Jan., 1952.

5201GR0003

Key Words - House Document/Not Annotated/

"Durability of Steel Sheet Piling in Shore Structures"
Rayner, A. C., and Ross, C. W., U. S. Army Beach Erosion Board Technical Memorandum
No. 12, Feb., 1952, 51 pp. (BEB T.M. No. 12)

5202GR0001

Along the Atlantic Coast of the United States and the Gulf Coast of Florida, 153 groups of steel sheet piling structures were

studied and classified. Structures were selected for various conditions of exposure, treatment, and types. Measurements and observations were made over a 10-year period and general conclusions presented regarding useful life of steel sheet piling. Measured and observed data are tabulated.

Key Words - N. Atlantic/S. Atlantic/Steel/Piling/Const-problems/
Field/

"Erosion Problems on the Ohio Shore of Lake Erie" 5204GR0001

Wells, J. D., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 20, No. 1, Apr., 1952, pp. 5-8. (TC330 .Am3)

The author gives a good review of costs (1952 figures) for groin projects along the Ohio shore of Lake Erie. Groins designs are given.

Key Words - Great Lakes/System/Economics/Timber/Steel/Piling/Field/
Structural-design/Artificial-fill/Rubble-mound/Concrete/
Impermeable/

"Concrete Blocks Form Low-Cost Groins" 5204GR0002
Weber, H., Engineering News-Record, McGraw-Hill Pub. Co., Vol. 148, No. 15, Apr., 1952, pp. 73-74.

Two installations of concrete-block groins were made on Long Island near Riverhead -- one in 1948, the second in 1950. The later project was built at Ocean Beach. Stabilization of the beaches has occurred. Construction procedures and structural criteria are presented.

Key Words - Concrete/Impermeable/Structural-design/N. Atlantic/
Field/Const-procedure/Economics/System/

"Report on Concrete Block Groins" 5205GR0001
Anonymous, U. S. Army Corps of Engineers, New York District, May, 1962.

Key Words - Not Annotated/

"Area 4 - Connecticut River to Hammonasset River, Conn., Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 514, 82nd Congress, 2nd Session, June, 1952.

5206GR0001

Key Words - House Document/Not Annotated/

"Measures Against Erosion at Groins and Jetties"

5210GR0001

Brunn, P., Proceedings of Third Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1952, pp. 137-164. (TC203 .C6)

One problem on a coast with littoral transport is erosion on the downdrift side of groins and jetties. This paper deals with the problem giving special consideration to conditions on the Danish North Sea Coast where many interesting problems of littoral transport and coastal protection are found. These are discussed as an introduction to the main part of the paper which is principally concerned with downdrift erosion and measures for its prevention.

Key Words - Erosion/Field/Misc-plan/Concrete/Model/Experimental/
Europe/Z-groins/T-groins/L-groins/Structural-design/
Economics/1900-1949/Corner-groins/Impermeable/

"Life of Steel Sheet Pile Structures in Atlantic Coastal States"

5210GR0002

Rayner, A. C., Proceedings of Third Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1952, pp. 209-216. (TC203 .C6)

Harbor bulkheads, beach bulkheads, and groins constructed of steel sheet piles were studied for more accurate estimates of the useful life based on rate of deterioration. Structures were located along the Atlantic Coast of the United States and the Gulf Coast of Florida. Mean rate of loss of thickness of sheet piles is given. It is shown that different types of structures and several parts of the same structure have different rates of loss.

Key Words - Steel/Texas Gulf/S. Atlantic/Field/N. Atlantic/Const-problems/Piling/

"Case History of Shore Protection at Presque Isle Peninsula, Pa."

5210GR0003

Lee, C. E., Proceedings of Third Conference
on Coastal Engineering, Council on Wave
Research of the Engineering Foundation,
Oct., 1952, pp. 331-343. (TC203 .C6)

5210GR0003

In the 117 years in which protective works have been applied to Presque Isle Peninsula there have been many types of structures and many methods of protection attempted. The large forces involved proved too great for vegetal growth alone to be effective in the porous material which forms the peninsula. Timber structures other than the rock-filled crib groins have had short life. Bulkheads exposed to the direct action of the waves have required frequent and expensive repairs. As demonstrated by the impoundment at the privately owned Kelso groin at the junction of the peninsula and the mainland, and at experimental groins, a spending beach gives best results. The problem is the method to be used in forming the beach.

Key Words - Accretion/Cantilever/Steel/System/Economics/Erosion/
Field/1900-1949/1950-1954/Impermeable/Permeable/

"Some Aspects of Shore Protection in Boston Harbor"

5210GR0004

Wey, G. L., Proceedings of Third Conference
on Coastal Engineering, Council on Wave Re-
search of the Engineering Foundation, Oct.,
1952, pp. 190-196. (TC203 .C6)

Costs, and a brief description of short riprap groins constructed normal to a seawall are presented.

Key Words - Impermeable/Low/Rubble-mound/N. Atlantic/Field/1950-
1955/Short/Economics/System/

"Development of the New Jersey Shore"

5210GR0005

Rankin, J. K., Proceedings of Third Con-
ference on Coastal Engineering, Council on
Wave Research of the Engineering Foundation,
Oct., 1952, pp. 306-317. (TC203 .C6)

Maintenance, history, and success of shore protection works, including groins, are discussed county by county along the New Jersey shore.

Key Words - N. Atlantic/System/Maintenance/Economics/Field/

"Illinois Shore of Lake Michigan, Beach Erosion Control Study" 5210GR0006
U. S. Army Corps of Engineers, House Document No. 28, 83rd Congress, 1st Session, Oct., 1952.

Key Words - House Document/Not Annotated/

"Appendix I, Coast of California, Carpinteria to Point Mugu, Beach Erosion Control Study" 5210GR0007
U. S. Army Corps of Engineers, House Document No. 29, 83rd Congress, 1st Session, Oct., 1952.

Key Words - House Document/Not Annotated/

"Information on Beach Protection in Florida" 5210GR0008
Anonymous, State of Florida, Board of Conservation, Division of Water Survey and Research, Paper No. 8, Oct., 1952, pp. 17-22. (TD224 .F6A3 No.8)

Shore protection techniques and structures are presented. Groins are discussed giving detailed structural criteria including length, spacing, height as used along the Florida and European coastlines.

Key Words - Scour/System/Structural-design/Rubble-mound/Misc-materials/Concrete/Erosion/Single/Europe/Timber/High/Steel/S. Atlantic/

"Area 5, Pawcatuck River to Thames River, Conn., Beach Erosion Control Study" 5212GR0001
U. S. Army Corps of Engineers, House Document No. 31, 83rd Congress, 1st Session, Dec., 1952.

Key Words - House Document/Not Annotated/

"Appendix VI, Ohio Shore Line of Lake Erie, Sandusky to Vermillion, Ohio, Beach Erosion Control Study" 5212GR0002
U. S. Army Corps of Engineers, House Document No. 32, 83rd Congress, 1st Session, Dec., 1952.

"Lake Michigan Erosion Studies"

5300GR0001

Hardin, J. R., and Booth, W. H., Transactions of the American Society of Civil Engineers, Vol. 118, Paper No. 2535, 1953, pp. 39-50

The State of Illinois, acting through its Division of Waterways, has become increasingly concerned with the erosion problem of Lake Michigan. As a result, the state requested a cooperative beach erosion control study to determine the best plan of improvement for stabilizing the shoreline. This paper deals with condition of existing structures, state of erosion, and describes recommended protective measures.

Key Words - Permeable/Impermeable/Long/High/Low/Concrete/Steel/Piling/Great Lakes/Field/Structural-design/Artificial-fill/Accretion/Erosion/1900-1949/1950-1954/

"Theoretical Observations for Installation of Coastal Protective Structures on Tideless Shores"

5300GR0002

Vollbrecht, K., Wasserwirtschaft-Wassertechnik, Berlin, West Germany, Vol. 3, No. 6, 1953.

Key Words - Not Annotated/

"Report to the Eighteenth International Navigation Congress"

5300GR0003

Van Asbeck, W. F., Ferguson, H. A., Schoemaker, H. J., Eighteenth International Navigation Congress, Permanent International Association of Navigation Congresses, Brussels, Section 2 - Ocean Navigation, Question 1, 1953, pp. 169-198.

Improvement of groins along the North Sea coast by asphalt grouting is reviewed. Mix design of the asphalt grout and design of the groins are given.

Key Words - Asphalt/Rubble-mound/Structural-design/Europe/Field/Low/Impermeable/1900-1949/

"Hydraulic Structures (Groins, Dams, Dykes, and Canal Embankments) of Bitumen Type" Rohnish, Bitumen, Heidelberg, 15, No. 9/10, 1953.

5300GR0004

Key Words - Not Annotated/

"Steep Shore of Brodten - Cause of Breaking"
Ottman, Transactions of Museum of Geography and Natural History, Lubeck, No. 44, 1953, pp. 145-195.

5300GR0005

Key Words - Not Annotated/

"Racine County, Wis., Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 88, 83rd Congress, 1st Session, Feb., 1953.

5302GR0001

Key Words - House Document/Not Annotated/

"Area 6 - Niantic Bay to Connecticut River, Connecticut, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 84, 83rd Congress, 1st Session, Feb., 1953.

5302GR0002

Key Words - House Document/Not Annotated/

"Precast Concrete Block Groins"
Weber, H., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 21, No. 1, Apr., 1953, pp. 3-5. (TC330 .Am3)

5304GR0001

Use of concrete blocks for groins is discussed in relation to structural design, durability, economics, and construction procedures. The advantage of blocks is illustrated by actual projects emphasizing fast construction and low cost.

Key Words - Concrete/Economics/N. Atlantic/1900-1949/1950-1954/
Structural-design/Impermeable/Low/Field/

"Appendix IV, Ohio Shore Line of Lake Erie, Sandusky Bay, Ohio, Beach Erosion Control Study" 5304GR0002
U. S. Army Corps of Engineers, House Document No. 126, 83rd Congress, 1st Session, Apr., 1953.

Key Words - House Document/Not Annotated/

"Appendix XIV Ohio Shore Line of Lake Erie, Sheffield Lake Village to Rocky River, Beach Erosion Control Study" 5304GR0003
U. S. Army Corps of Engineers, House Document No. 127, 83rd Congress, 1st Session, Apr., 1953.

Key Words - House Document/Not Annotated/

"Coast Protection: Some Recent Works on the East Coast, 1942-52" 5306GR0001
Duvivier, J., Journal of the Institution of Civil Engineers, London, Paper No. 5901, June, 1953, pp. 510-531.

As a result of floods and erosion at Lincolnshire, England, a substantial scheme of new construction and reinforcement of the old defenses was carried out between 1943 and 1949. Costs, structural-design, and construction of these works, including groins, are presented.

Key Words - Economics/1940-1944/1945-1949/Timber/System/Field/Piling/
Europe/Structural-design/Low/Long/Impermeable/Concrete/
Steel/1950-1954/Const-procedure/Short/Accretion/Erosion/
Maintenance/Const-problems/

"Area 3 - New Haven Harbor to Housatonic River, Conn., Beach Erosion Control Study" 5306GR0002
U. S. Army Corps of Engineers, House Document No. 203, 83rd Congress, 1st Session, July, 1953.

Key Words - House Document/Not Annotated/

"Ocean City, N. J., Beach Erosion Control Study" 5306GR0003

U. S. Army Corps of Engineers, House Document 184, 83rd Congress, 1st Session, June, 1953.

Key Words - House Document/Not Annotated/

"Virginia Beach, Va., Beach Erosion Control Study" 5306GR0004

U. S. Army Corps of Engineers, House Document No. 186, 83rd Congress, 1st Session, June, 1953.

Key Words - House Document/Not Annotated/

"Materialvandring Pa Harkyster" 5306GR0005

Bruun, P., Ingeniaren, 62 Argang No. 30, July, 1953.

English Summary: "Measures Against Erosion at Groups of Groins."

Key Words - Not Annotated/

"Cold Spring Inlet (Cape May Harbor), N. J." 5307GR0001

U. S. Army Corps of Engineers, House Document No. 206, 83rd Congress, 1st Session, July, 1953.

Key Words - House Document/Not Annotated/

"Gulf Shore of Galveston Island, Tex., Beach Erosion Control Study" 5307GR0002

U. S. Army Corps of Engineers, House Document No. 218, 83rd Congress, 1st Session, July, 1953.

Key Words - House Document/Not Annotated/

"Waikiki Beach, Island of Oahu, T. H.,
Beach Erosion Control Study" 5308GR0001
U. S. Army Corps of Engineers, House Document, No. 227, 83rd Congress, 1st Session, Aug., 1953.

Key Words - House Document/Not Annotated/

"Plum Island, Mass., Beach Erosion Control Study" 5308GR0002
U. S. Army Corps of Engineers, House Document No. 243, 83rd Congress, 2nd Session, Aug., 1953.

Key Words - House Document/Not Annotated/

"Appendix VIII, Ohio Shore Line of Lake Erie between Vermillion and Sheffield Lake Village, Beach Erosion Control Study" 5308GR0003
U. S. Army Corps of Engineers, House Document No. 229, 83rd Congress, 1st Session, Aug., 1953.

Key Words - House Document/Not Annotated/

"Presque Isle Peninsula, Erie, Pa., Beach Erosion Control Study" 5308GR0004
U. S. Army Corps of Engineers, House Document No. 231, 83rd Congress, 1st Session, Aug., 1953.

Key Words - House Document/Not Annotated/

"Experimental Groins, Camp Perry, Ohio" 5309GR0001
Anonymous, Sept., 1953, Unpublished Pictorial Report. (V.F. 618 9/22/53)

A photographic history, this report reviews the construction and progressive condition of a "mix-in-place" groin for a period of two months, and construction and condition of an "intrusion grouted rockfill" groin.

Key Words - Great Lakes/Field/Experimental/Structural-design/
Impermeable/Const-procedure/Rubble-mound/Misc-
materials/1950-1954/Photographic/Single/

"Low Cost Shore Protection Used on the Great
Lakes"

5310GR0001

Brater, E. F., Proceedings of Fourth Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1953, pp. 214-226. (TC203 .C6)

This paper presents results of 3 years of field observations on low cost beach protection structures in use on the Great Lakes. Structures were studied in regard to their effectiveness as beach building and protective devices and with respect to their durability in resisting ice and wave forces. The term "low cost" refers to structures which cost between \$10 and \$30 per foot of frontage at 1952 prices.

Key Words - Great Lakes/Accretion/Economics/Const-problems/Timber/
Concrete/Structural-design/Impermeable/

"Principles of Shore Protection for the
Great Lakes"

5310GR0002

Mason, M. A., Proceedings of Fourth Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1953, pp. 207-213. (TC203 .C6)

The author states that a requirement of impermeability is absolute for groins built on shores of the Great Lakes. Because of the scarcity of natural shore sediment, permeable groins would be inadequate. The paper presents discussion of the coastal engineer's role and duty in shore protection.

Key Words - Great Lakes/Impermeable/

"Filling Pattern of the Fort Sheridan Groin
System"

5310GR0003

Lee, C. E., Proceedings of Fourth Conf. on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Oct., 1953, pp. 227-248. (TC203 .C6)

Analysis of the action of a groin system through the 14 months following construction is reported. Six surveys were made during this period which included onshore elevations to the bluff line and offshore soundings to about 7-foot depths. Wind records for investigation were studied, and hindcasts of wave conditions made. Analysis reveals that the cumulative volume of impoundment at the system may be expressed approximately. Tables of impoundment volumes are included as well as an energy index, and the relationship is discussed. Filling patterns of the system are recorded.

Key Words - Great Lakes/Cantilever/Steel/Accretion/Low/Long/System/
Impermeable/

"Area 7, Housatonic River to Ash Creek, Conn., Beach Erosion Control Study" 5310GR0004
U. S. Army Corps of Engineers, House Document No. 248, 83rd Congress, 2nd Session, Oct., 1953.

Key Words - House Document/Not Annotated/

"Coastal Protection, Review of Methods for Defence" 5311GR0001
Bruun, P., The Dock and Harbour Authority, London, Vol. 34-35, Nov., Dec., 1953, 10 pp. (V.F. 1289 11/53)

The author discusses and defines different types of groins, stating that they have often done more harm than good. Given also are conditions under which groins should or should not be built, and their long- and short-range influences.

Key Words - L-groins/T-groins/Z-groins/Corner-groins/Misc-plan/
Piling/Single/System/Field/Europe/Timber/Economics/
Erosion/Accretion/Impermeable/

"Appendix II, Coast of California, Point Mugu to San Pedro Breakwater, Beach Erosion Control Study" 5311GR0002
U. S. Army Corps of Engineers, House Document No. 277, 83rd Congress, 2nd Session, Nov., 1953.

Key Words - House Document/Not Annotated/

"Photographs of Ft. Macon near Morehead City, North Carolina after Series of Hurricanes in 1954" 5400GR0001
Anonymous, U. S. Army Beach Erosion Board, 1954, Unpublished Report. (V.F. 1772 (1954))

This report includes a photograph that shows 1954 hurricane damage, and presents a plan for improvement of beach stability through construction of groins.

Key Words - Photographic/Erosion/S. Atlantic/Impermeable/Rubble-mound/1950-1954/

"Model Tests with Moveable Floor in Sea and Sea Harbor Construction" 5400GR0002
Blau, E., Wasserwirtschaft - Wassertechnik, Berlin, Vol. 4, No. 4, 1954, pp. 244-251.

Key Words - Not Annotated/

"Actual Problems of Coastal Protection" 5400GR0003
Bulow, K., Wasserwirtschaft - Wassertechnik, Berlin, Vol. 2, No. 9, 1954.

Key Words - Not Annotated/

"Model Tests of Wave Run-up on Sea Dykes in Watt Region" 5400GR0004
Hansen, W., Proceedings of the Testing Institute of Hannover, Hannover, Germany, No. 5, 1954, pp. 123-165.

Key Words - Not Annotated/

"General Coastal Dynamics and Coastal Protection of the South Baltic Sea between Trave and Swine" 5400GR0005
Bulow, K., Geologie 10, 1954.

Key Words - Not Annotated/

"Appendix XI, Ohio Shore Line of Lake Erie,
Euclid to Chagrin River, Beach Erosion
Control Study"

5402GR0001

U. S. Army Corps of Engineers, House Document No. 324, 83rd Congress, 2nd Session, Feb., 1954.

Key Words - House Document/Not Annotated/

"Hampton Beach, N. H., Beach Erosion
Control Study"

5402GR0002

U. S. Army Corps of Engineers, House Document No. 325, 83rd Congress, 2nd Session, Feb., 1954.

Key Words - House Document/Not Annotated/

"Anaheim Bay Harbor, Calif."

5403GR0001

U. S. Army Corps of Engineers, House Document No. 349, 83rd Congress, 2nd Session, Mar., 1954.

Key Words - House Document/Not Annotated/

"Selkirk Shores State Park, N. Y., Beach
Erosion Control Study"

5403GR0002

U. S. Army Corps of Engineers, House Document No. 343, 83rd Congress, 2nd Session, Mar., 1954.

Key Words - House Document/Not Annotated/

"Pinellas County, Fla., Beach Erosion
Control Study"

5404GR0001

U. S. Army Corps of Engineers, House Document No. 380, 83rd Congress, 2nd Session, Apr., 1954.

Key Words - House Document/Not Annotated/

"Coast Erosion and the Development of Beach Profiles"
Bruun, P., U. S. Army Beach Erosion Board
Technical Memorandum, No. 44, June, 1954,
pp. 2-64. (BEB T.M. 44)

5406GR0001

A groin system built during 1875-1909 and its subsequent maintenance is described. Shoreline changes, erosion profiles, and actual and theoretical quantities of eroded material along the Danish North Sea Coast are given.

Key Words - Europe/1900-1949/Concrete/Impermeable/Scour/Structural-design/Maintenance/Terminal/Field/System/Erosion/Theory/

"Fundamentals of Coast Erosion and Defence"
Minikin, R. R., Proceedings of Fifth Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation,
Sept., 1954, pp. 448-471. (TC203 .C6)

The author presents examples of European coastal problems and the remedies applied. Countries include England, Denmark, Holland, Belgium, France, Spain, and Italy.

Key Words - Low/Timber/Europe/System/Concrete/Terminal/Field/Impermeable/Scour/Accretion/High/Rubble-mound/Misc-materials/Structural-design/Steel/Short/Single/1900-1949/1950-1954/

"Bitumen in Coastal Engineering"
van Asbeck, W. F., Proceedings of Fifth Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation,
Sept., 1954, pp. 587-618. (TC203 .C6)

5409GR0002

Aspects of the design of coastal protection works using bitumen are given. A short review of important shore protection structures, including groins; methods of application and properties of bituminous construction; and a number of representative examples of each type of application are given.

Key Words - Asphalt/Structural-design/Impermeable/Misc-materials/Maintenance/Europe/1900-1949/1950-1954/

"Problèmes de Défense des Côtes Résultent de
Échecs de Quelques Ouvrages"
Dreyfous-Ducas, M., Proceedings of Fifth
Conference on Coastal Engineering, Council
on Wave Research of the Engineering Founda-
tion, Sept., 1954, pp. 495-513. (TC203 .C6)

5409GR0003

Translated Title: "Sea-Defense Problems -- Success and
Failure of Some Structures."

The author analyzes reasons of success or failure of various
sea defense works. Groins and breakwaters built since 1830 in
southwest France are discussed. For groins low permeability is
desirable, while long groins are undesirable. (Text is not trans-
lated.)

Key Words - 1800-1900/1900-1949/1950-1954/Europe/Permeable/Long/
Impermeable/

"Les Ouvrages de Défense Contre la Mer Sur
la Côte Française de L'Océan Entre la Loire
et la Gironde"

5409GR0004

Blondeau, M.; and Baste, M., Proceedings of
Fifth Conference on Coastal Engineering,
Council on Wave Research of the Engineering
Foundation, Sept., 1954, pp. 514-554.
(TC203 .C6)

Translated Title: "Sea-Defence Works of the Atlantic Coast
between the Loire and Gironde."

Among the various shore protection structures, groins, their
purpose and type of groins found along the coast between Loire and
Gironde are discussed. (Text is not translated.)

Key Words - Timber/Concrete/Misc-materials/Adjustable/Field/

"Observations on the Travel of Shore Material
Along a Chalk Foreshore"

5409GR0005

Coultas, H. W.; Proceedings of Fifth Conference
on Coastal Engineering, Council on Wave Re-
search of the Engineering Foundation, Sept., 1954,
pp. 381-382. Abstract. (TC203 .C6)

Groins are discussed in an abstract of a paper published in
1920 in the Journal of the Institution of Municipal and County

Engineers, an English journal.

Key Words - System/Europe/Concrete/Accretion/Misc-plan/1900-1949/

"On the Coastal Groins"

5411GR0001

Nagai, S., Proceedings of First Conference
on Coastal Engineering, JSCE, Nov., 1954

Key Words - Not Annotated/

"Concrete Shore Protection"

5500GR0001

Anonymous, Portland Cement Association,
Chicago, Illinois, 1955, pp. 3-31. (Brochure)
(V.F. 1244)

An illustrated brochure on the use of concrete foreshore protection structures deals briefly with erosion and its causes, and presents a concise analysis of wave action. Types of seawalls, revetments, groins, and jetties are also discussed with regard to applicability of various sections of the structures to different problems.

Key Words - Concrete/System/Erosion/Structural-design/Permeable/
Geometric-shapes/1900-1949/1950-1954/Single/Impermeable/

"Allgemeine Empfehlungen für den
Deutschen Küstenschutz"

5500GR0002

Coastal Commission of North Sea and Baltic
Sea, Die Küste, Kiel, West Germany, Vol. 4, 1955,
pp. 52-61. (GS457.5 .K97)

Translated Title: "General Recommendations for German Coastal Protection."

Key Words - Not Annotated/

"Hundert Jahre Küstenschutz an der Nordsee"

5500GR0003

Lorenzen, J. M., Die Küste, Kiel, West Germany,
Vol. 3, No. 1/2, 1955, pp. 18-32. (GB457.5
.K97)

Translated Title: "Hundred Years of Coastal Protection on the North Sea."

Key Words - Not Annotated/

"What Water Economy Expects from Coastal Research" 5500GR0004

Reineke, H., Wasserwirtschaft-Wassertechnik,
Berlin, Vol. 8, 1955, pp. 249-250.

Key Words - Not Annotated/

"Beach Abrasion by Waves - Reflection on Steep Wall Type of Coastal Protective Structures" 5500GR0005

Vollbrecht, K., Wasserwirtschaft-Wassertechnik,
Berlin, No. 8, 1955, pp. 251-257, 333-339

Key Words - Not Annotated/

"Origin and Development of Island Protective Works on Norderney" 5500GR0006

Peper, G., Archives Nieders 8, No. 3, 1955-1956, pp. 175-196.

Key Words - Not Annotated

"Surge and Shore Changes on the West Coast of Sylt" 5500GR0007

Lamprecht, H., Proceedings of the Testing Institute of Hannover, Hannover, Germany, No. 8, 1955, pp. 80-136.

Key Words - Not Annotated/

"The Effect of Island Protective Structures on Beach Development in West Part of Norderney" 5500GR0008

Kramer, J., and Homeier, H., Norderney Annual Report, Vol. 6, 1955, pp. 15-38.

"Helgoland, History of its Origin and Maintenance of its Harbor Relative to Navigation"

5500GR0009

Bahr, M., Yearbook of North Friesian Society 30, 1955, pp. 203-218.

Key Words - Not Annotated/

"The Asphalt Groins at Ocean City, Maryland"

5504GR0001

Williams, R. K., Asphalt Institute Quarterly, Vol. 7, No. 2, Apr., 1955, pp. 6-8.

Photographs illustrate construction procedures, and design criteria for asphalt groins. A subsequent survey of the 33-element groin system, constructed in 1954 at Ocean City, showed that the beach had built up.

Key Words - Asphalt/Structural-design/Const-procedures/1950-1954/
Impermeable/Low/N. Atlantic/

"The Fernandina Beach Groins"

5504GR0002

Woodson, D. D., Asphalt Institute Quarterly, Vol. 7, No. 2, Apr., 1955, p. 8.

Eight asphalt groins on Fernandina Beach, Florida, were constructed in 1953 with wood piling reenforcement. One year later the system had caused a marked buildup of material.

Key Words - Impermeable/Timber/Piling/S. Atlantic/Structural-design/
1950-1954/Low/Asphalt/

"Stability of Beaches"

5504GR0003

Bruun, P., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 23, No. 1, Apr., 1955, pp. 21-25. (TC330 .Am3)

Groins, seawalls, breakwaters, and artificial nourishment are

discussed. A figure gives in tabulated format the effects of four protective measures under different conditions of the beach.

Key Words - Adjustable/Artificial-fill/Erosion/Accretion/

"Grand Isle, La., Beach Erosion Control Study" 5504GR0004

U. S. Army Corps of Engineers, House Document No. 132, 84th Congress, 1st Session, Apr., 1955.

Key Words - House Document/Not Annotated/

"Fair Haven Beach State Park, N. Y., Beach Erosion Control Study" 5504GR0005

U. S. Army Corps of Engineers, House Document No. 134, 84th Congress, 1st Session, Apr., 1955.

Key Words - House Document/Not Annotated/

"Hamlin Beach State Park, N. Y., Beach Erosion Control Study" 5504GR0006

U. S. Army Corps of Engineers, House Document No. 138, 84th Congress, 1st Session, Apr., 1955.

Key Words - House Document/Not Annotated/

"How to Build a Beach at Economy Prices" 5509GR0001

Anonymous, Engineering News-Record, McGraw-Hill Pub. Co., Vol. 155, No. 10, Sept. 8, 1955, pp. 34-36, 40-41.

The article describes low, impermeable groins, and states that asphalt groins are more economical than comparable timber groins. Design, construction, and success of asphalt groins built on the coast of Maryland is presented and compared with that of timber groins.

Key Words - N. Atlantic/Asphalt/Timber/Economics/Impermeable/Low/Const-procedure/Structural-design/Permeable/Scour/Const-problems/Accretion/System/

"City of Kenosha, Wis., Beach Erosion Control Study"

5509GR0002

U. S. Army Corps of Engineers, House Document No. 273, 84th Congress, 2nd Session, Sept., 1955.

Key Words - House Document/Not Annotated/

"Maryland's Favorite Beach at Ocean City"

5510GR0001

Hopkins, W. C., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 23, No. 2, Oct., 1955, pp. 8-11. (TC330 .Am3)

A historical review of shore protection structures and their effects at Ocean City is given. In 1954 a 33-element, asphalt groin system was built. Structural and mix designs, costs, and construction procedures of the asphalt groins are presented.

Key Words - Haupt/Timber/Permeable/1900-1949/Accretion/N. Atlantic/Impermeable/System/1950-1954/Asphalt/1955-1959/Const-procedure/Const-problems/Economics/High/Low/

"Division of Shore Erosion - Ohio"

5510GR0002

Kugel, F. O., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 23, No. 2, Oct., 1955, pp. 20-23. (TC330 .Am3)

Groin construction projects along the Ohio shore of Lake Erie including experimental projects are reviewed. Structural design and costs of construction are given.

Key Words - Great Lakes/1950-1954/Timber/Piling/Steel/Economics/Experimental/Field/Rubble-mound/Impermeable/System/

"Coastal Development and Coastal Protection"

5511GR0001

Bruun, P., Engineering Progress at the University of Florida, Bulletin Series No. 76, Vol. 9, No. 11, Nov., 1955, pp. 7-30. (TC203 .F62v9no11)

An attempt is made to explain the connection between coastal development and coastal protection. Florida has two problems; the sea, and property owners at the seashore who often build homes too

close to the shoreline. The problems involved in beach erosion are explained in terms of source and loss of materials. Beach profiles, groins, and revetments are discussed.

Key Words - S. Atlantic/System/Structural-design/Field/Timber/
Rubble-mound/Permeable/Impermeable/T-groins/L-groins/
Z-groins/Corner-groins/Misc-plan/Piling/

"Asphalt Groins and Jetties"

5511GR0002

Asphalt Institute, Asphalt Leads
the Fight Against Beach Erosion,
Information Series, No. 94, Nov., 1955,
pp. 1-5. (V.F. 928 11/55)

Presenting a pictorial review of various groin construction sites, this article also gives design specifications, mix design, and construction specifications for asphalt groins.

Key Words - Asphalt/Const-procedure/S. Atlantic/Structural-design/
N. Atlantic/Impermeable/

"The Longitudinal Stability of Beaches"

5511GR0003

Hoyle, J. W., and King, G. T., Journal
of the Institution of Municipal Engineers,
London, Vol. 82, No. 5, Nov., 1955, pp. 181-
191. (GB454 B3H6)

A brief mention is made concerning the application and basic purpose of groins for foreshore stabilization.

Key Words - Accretion/Misc-plan/Theory/

"On the Flow Characteristics in the
Vicinity of Groins"

5511GR0004

Shimano, T., Hom-ma, M., and Horikawa, S.,
Proceedings of the Third Conference on
Coastal Engineering in Japan, JSCE, Vol. 3,
Nov., 1955, pp. 195-202. (TC203 .C748)
(Not Translated)

Key Words - Not Annotated/

"On the Alignment of Coastal Groins"
Nagai, S., Proceedings of the Second
Conference on Coastal Engineering in
Japan, JSCE, Nov., 1955, pp. 107- 116.
(TC203 .C748) (In Japanese)

5511GR0005

Key Words - Not Annotated/

"On the Effects of Groins"
Shimano, T., Hom-ma, M., and Horikawa, S.,
Proceedings of the Second Conference on
Coastal Engineering in Japan, JSCE, Nov.,
1955, pp. 49-56. (TC203 .C748) (In
Japanese)

5511GR0006

Key Words - Not Annotated/

"Some Ideas on the Problem of Research
in Coastal Dynamics and Model Tests of
Coastal Protection"
Bruns, E., Wasserwirtschaft-Wassertechnik,
Berlin, No. 12, 1956, pp. 387-390.

5600GR0001

Key Words - Not Annotated/

"What Happened to Protection of Our Baltic
Sea Coast?"
Kolp, O., Wasserwirtschaft-Wassertechnik,
Berlin, Vol. 6, No. 8, 1956, pp. 229-231.

5600GR0002

Key Words - Not Annotated/

"Island Protection on East-Friesian Coast"
Jansen, T., Hansa, Hamburg, Vol. 93, No. 44/45,
1956, pp. 2108-2110.

5600GR0003

Key Words - Not Annotated/

"Aus den Arbeiten des Küstenausschusses
Ost"
Reineke, H., Die Küste, Kiel, West Germany,
Vol. 5, 1956, pp. 1-8. (GB457.5 .K97) (Not

5600GR0004

Translated)

Translated Title: "Works of the Coastal Commission - East"

Key Words - Not Annotated/

"Flood Protection and Coast Stabilization" 5600GR0005
Leopold, E., Hutte, Berlin, Vol. 3, 1956,
pp. 1076-1082.

Key Words - Not Annotated/

"Suitability of Model Tests in Maritime 5600GR0006
Engineering in Harbors, Seaways, and
Coastal Protection"
Zschiesche, O., Wasserwirtschaft-Wassertechnik,
Berlin, No. 12, 1956, pp. 383-386.

Key Words - Not Annotated/

"Coastal Changes and Coastal Protection of 5600GR0007
the Island Hiddensee"
Reinhard, H., Berlin, 1956.

Key Words - Not Annotated/

"Asphalt Groins in U. S. A." 5600GR0008
Peters, A. G., Baumasch und Bautechnik
3, No. 11, 1956, p. 337.

Key Words - Not Annotated/

"Behavior of Beach Fill at Ocean City, 5602GR0001
New Jersey"
Watts, G. M., U. S. Army Beach Erosion
Board Technical Memorandum, No. 77,
Feb., 1956, 33 pp.

Analysis of beach erosion at Ocean City, New Jersey, led to the
conclusion that the most suitable plan of protection was artificial

placement of suitable sand on the shore and extension of seven existing stone groins. A study of the completed project revealed that loss of beach fill exceeded the estimated rate because: (1) fill sediment was finer-grained than the native sand; (2) shifting of inlet channels and bars caused extensive movement of beach material and; (3) the shoreline in the project area advanced relative to the adjacent shoreline to the southwest.

Key Words - Rubble-mound/System/Field/Impermeable/Erosion/
N. Atlantic/Accretion/

"Manitowoc County from Two Rivers to
Manitowoc, Wis., Beach Erosion Control
Study" 5602GR0002
U. S. Army Corps of Engineers, House
Document No. 348, 84th Congress, 2nd
Session, Feb., 1956.

Key Words - House Document/Not Annotated/

"Shore of New Jersey from Sandy Hook to
Barnegat Inlet, Beach Erosion Control
Study" 5603GR0001
U. S. Army Corps of Engineers, House
Document No. 361, 84th Congress, 2nd Session,
Mar., 1956.

Key Words - House Document/Not Annotated/

"Beach Erosion Control Grand Isle,
Louisiana" 5604GR0001
Myers, H. B., and Theis, A. R., Shore and
Beach, American Shore and Beach Preservation
Assoc., Vol. 24, No. 1, Apr., 1956, pp. 19-
22. (TC330 .Am3)

A series of fourteen timber groins were built at Grand Isle, Louisiana to control erosion. Erosion was not checked, and following Beach Erosion Board recommendations, hydraulic fill was introduced into the system. Preparation procedures are outlined, quantitative figures on sand loss and gain, and textural characteristics of the sand are given.

"Oceanside, Ocean Beach, Imperial Beach,
and Coronado, San Diego County, Calif.,
Beach Erosion Control Study" 5605GR0001
U. S. Army Corps of Engineers, House
Document No. 399, 84th Congress, 2nd
Session, May, 1956.

Key Words - House Document/Not Annotated/

"Area 9, East River to New Haven Harbor,
Connecticut, Beach Erosion Control Study" 5605GR0002
U. S. Army Corps of Engineers, House
Document No. 395, 84th Congress, 2nd
Session, May, 1956.

Key Words - House Document/Not Annotated/

"Fire Island Inlet to Jones Inlet, Long
Island, N. Y., Cooperative Beach Erosion
Control Study" 5605GR0003
U. S. Army Corps of Engineers, House
Document No. 411, 84th Congress, 2nd
Session, May, 1956.

Key Words - House Document/Not Annotated/

"Waimea Beach and Hanapepe Bay, Island of
Kauai, T. H., Beach Erosion Control Study" 5606GR0001
U. S. Army Corps of Engineers, House Docu-
ment No. 432, 84th Congress, 2nd Session,
June, 1956.

Key Words - House Document/Not Annotated/

"Interim Report on Asphalt Groins at Ocean
City, Maryland" 5607GR0001
Anonymous, Beach Erosion Board Interim Report,
July, 1956. (V.F. 1890 7/56)

Study of asphalt structures as shore protection works is a part of the Beach Erosion Board's General Investigation Program to evaluate the structural and functional effectiveness of shore protective structures. The objective of the study of existing asphalt shore structures is to compile information on the structural and functional performance of these structures. A final report will be prepared when sufficient data are compiled.

Key Words - Photographic/System/Field/Impermeable/

"Curved Groynes and Foreshore Defence"
Rylands, A., Civil Engineering and Public
Works Review, London, July, 1956, pp. 769-
772. (V.F. 1989)

5607GR0002

The author states that alternating straight and curved groins in a system is superior to an exclusively straight groin system for the following reasons: (1) considerable neutralization of wave assault, (2) reduction in backwash scour, (3) stoppage of littoral drift, (4) reduced sensitivity to changes in wind direction, (5) ability to deposit material to leeward, straight onshore, or to windward as required for the formation of a uniformly protective beach.

Key Words - Misc-plan/Low/Timber/Notched/Field/1955-1959/Structural-
design/Impermeable/Europe/

"Arrangement of Groins on a Sandy Beach"
Nagai, S., Journal of Waterways and
Harbors Division, ASCE, Vol. 82, No. WW4,
Paper 1063, Sept., 1956, 13 pp. (TC305
.J3v.2)

5609GR0001

It is an important and difficult problem to arrange groins effectively for protection against erosion by wave action on a sandy shore. This paper presents the relation of groin length, space, and orientation with respect to the shoreline, direction of wave propagation, and breaking point of the breakers. Relationship between wave steepness and sand transport, and some results of experiments concerning special types of groins are also presented.

Key Words - Scour/Erosion/Accretion/Experimental/Misc-plan/Long/Short/
Model/Impermeable/Theory/Single/System/Structural-design/

"Timber in the Construction of Sea Defence
and River Works"
Cotton, K. E., Civil Engineering and Public
Works Review, London, Sept., 1956, pp. 998-
1001. (V.F. 3020)

5609GR0002

This article presents the author's practical experience in the use of timber in sea defense and river works, and offers observations concerning merits of timber.

Key Words - Timber/Europe/Misc-plan/Structural-design/Steel/Permeable/
Impermeable/

"Impermeable and Permeable Groins"
Bruun, P., 1957, Coastal Engineering
Laboratory, Univ. of Florida, Un-
published Commentary, 3 pp. (TC535 .B4)

5700GR0001

Author comments on groin adjustability, ruggedness, and permeability.

Key Words - Permeable/Adjustable/Impermeable/Misc-plan/

"Functions of Groins Fundamental Study
on Beach Sediment Affected by Groins (1)"
Shimano, T., Hom-ma, M., Horikawa, K.,
Sakou, T., Proceedings of the Fourth
Conference on Coastal Engineering in
Japan, JSCE, 1957, pp. 111-121.
(TC20d .C748)

5700GR0002

This study examines the mechanism of beach deformation and provides criteria for the design of a groin. Functions of a groin are related to such factors as the characteristics of waves in the surf zone, sediment motion by waves and littoral currents, and eventual deformation of beach and nearshore topographies.

In building groins, the angle to the shoreline should be directed updrift, and the lengths should be adjusted so the tips will form a natural curve merging with the downcoast shoreline.

Key Words - Scour/Model/Long/Experimental/Impermeable/Erosion/
Accretion/

Die Nordöstliche Heide Mecklenburgs
Kolp, O., Veb Deutscher Verlag der
Wissenschaften, Berlin, 1957, 282 pp.

5700GR0003

Translated Title: "The North Heath of Mecklenburg"

Key Words - Not Annotated/

"Provisions for Stabilization and Main-
tenance of Floating Islands of the South
Coast of German North Sea"
Jansen, T., and Hansen, W., German Report
of Nineteenth Planc, London, 1957.

5700GR0004

Key Words - Not Annotated/

"Construction of a Heavy Dune Cover by
Asphalt - Basalt Method on the Island of
Borkum"
Braun, W., Bitumen, Heidelberg, 8/9, 1957,
pp. 176-182.

5700GR0005

Key Words - Not Annotated/

"Uferveränderungen und Küstenschutz auf
Sylt"
Lamprecht, H., Die Küste, Kiel, West
Germany Vol. 6, No. 2, 1957, pp. 39-93.
(GB457 .K97) (Not Translated)

5700GR0006

Translated Title: "Coastal Changes and Coastal Protection on
Sylt"

Key Words - Not Annotated/

"Folgerungen aus Untersuchungen über
Küstenschutzprobleme auf Sylt"
Rieder, K., Die Küste, Kiel, West Germany,
Vol. 6, No. 1, 1957, pp. 1-2. (GB457.5
.K97) (Not Translated)

5700GR0007

Translated Title: "Coastal Changes and Coastal Protection
Problems of the Island Sylt"

Key Words - Not Annotated/

"Die Abbruchursachen an der Nordwestküste
des Ellenbogens auf Sylt"

5700GR0008

Hundt, C., Die Küste, Kiel, West Germany,
Vol. 6, No. 2, 1957, pp. 3-38.
(GB457.5 .K97) (Not Translated)

Translated Title: "Causes of Slides on the Northwest Part of
Sylt"

Key Words - Not Annotated/

"Küstenforschungen im Raum Fehmarn-
Nordwagrien"

5700GR0009

Magens, C., Die Küste, Kiel, West Germany,
Vol. 6, No. 1, 1957, pp. 4-39.
(GB457.5 .K97) (Not Translated)

Translated Title: "Coastal Researches in the Area of Fehmarn-
Nordwagrien."

Key Words - Not Annotated/

"Brandungsuntersuchungen an den Küsten
von Fehmarn und Nordwagrien"

5700GR0010

Magens, C., Die Küste, Kiel, West Germany,
Vol. 6, No. 1, 1957, pp. 40-63.
(GB457.5 K97) (Not Translated)

Translated Title: "Surge Investigations on the Coast of Fehmarn
and Nordwagrien"

Key Words - Not Annotated/

"Effects of Coastal Protective Structures on
Sylt"

5700GR0011

Lamprecht, H., Wasserwirtschaft, Stuttgart,
Vol. 47, No. 5, 1957.

Key Words - Not Annotated/

"Coastal Protection and Scientific Basis of Research"

5700GR0012

Schmitz, H. P., Wasserwirtschaft-Wassertechnik, Berlin, West Germany, Vol. 7, No. 2, 1957, pp. 64-74.

Key Words - Not Annotated/

"Possibilities and Limits for Application of Asphalt Types of Constructions for Coastal Protection"

5700GR0013

Zischer, F. F., Proceedings of the Testing Institute of Hannover, No. 12, 1957.

Key Words - Not Annotated/

"Artificial Restoration of Beaches with Special Regard for Beach Flushing, Norderney, 1951-52"

5700GR0014

Kramer, J., Annual Report of Research Institute, Norderney, Vol. 9, 1957, pp. 107-139.

Key Words - Not Annotated/

"Protection Works on the Mexican Coast: the Creation of Beaches and Dunes"

5701GR0001

Diaz-Marta, M., The Dock and Harbour Authority, London, Vol. 37, Nos. 435-436, Jan., Feb., 1957, pp. 306-309, 338-340.

A system of four rubble-mound groins was constructed at Vera Cruz, Mexico. Among the various protective structures constructed, these groins helped to stabilize the beach.

Key Words - Rubble-mound/Central America/System/1955-1959/

"Chatham, Mass., Beach Erosion Control Study"

5704GR0001

U. S. Army Corps of Engineers, House Document No. 167, 85th Congress, 1st Session, Apr., 1957.

"Photographs of Compo Beach, Westport,
Conn. After Groin Construction and Before
Fill Placement"

5705GR0001

U. S. Army Corps of Engineers, May, 1957,
New England Division, Boston, Mass.,
Unpublished Report. (V.F. 1772 5/17/57
Westport)

Four 8- by 10-inch oblique aerial photographs show Compo Beach,
Westport, Conn. after groin construction, but before fill was placed.

Key Words - Single/Field/Impermeable/Rubble-mound/N. Atlantic/
1955-1959/Long/Low/Photographic/

"Photographs of Sasco Hill Beach, Fairfield,
Conn. After Groin Construction and Before
Fill Placement"

5705GR0002

U. S. Army Corps of Engineers, May, 1957,
New England Division, Boston, Mass., Un-
published Report. (V.F. 1772 5/17/52
Fairfield)

Three 8- by 10-inch oblique aerial photographs of Sasco Hill
Beach, Fairfield, Conn., show groins before fill was placed.

Key Words - Single/Field/Impermeable/Rubble-mound/N. Atlantic/
1955-1959/Long/Low/Photographic/

"Areas 8 and 11, Saugatuck River to Byram
River, Conn., Beach Erosion Control Study"

5705GR0003

U. S. Army Corps of Engineers, House Docu-
ment No. 174, 85th Congress, 1st Session,
May, 1957.

Key Words - House Document/Not Annotated/

"Santa Cruz County, Calif., Beach Erosion
Control Study"

5705GR0004

U. S. Army Corps of Engineers, House Docu-
ment No. 179, 85th Congress, 1st Session,

May, 1957.

Key Words - House Document/Not Annotated/

"Delaware Coast from Kitts Hummock to Fenwick Island, Beach Erosion Control Study" 5707GR0001
U. S. Army Corps of Engineers, House Document No. 216, 85th Congress, 1st Session, July 1957.

Key Words - House Document/Not Annotated/

"Asphalt Groins - Two-year Report" 5708GR0001
Anonymous, Engineering News-Record, McGraw-Hill Pub. Co., Vol. 159, Aug. 22, 1957, pp. 42-44.

Asphalt groins were inspected 2 years after construction. Inspection showed that the groins had caused accretion of sediment and that during at least six hurricanes and many lesser storms they had held the beach.

Key Words - Asphalt/N. Atlantic/Economics/Low/Impermeable/1950-1954/1955-1959/System/Accretion/Erosion/

"Appendix VI, Humboldt Bay (Buhne Point), Calif., Beach Erosion Control Study" 5709GR0001
U. S. Army Corps of Engineers, House Document No. 282, 85th Congress, 2nd Session, Sept., 1957.

Key Words - House Document/Not Annotated/

"Florida Coastal Problems" 5712GR0001
Bruun, P., Gerritsen, F., and Morgan, w. H., Proceedings of Sixth Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Dec., 1957, pp. 463-509. (TC203 .C6)

A short review describes the types of groins used along Florida's

shoreline. The authors believe that the best groin for Florida is either the low, impermeable, nonadjustable groin or the impermeable, adjustable type.

Key Words - Impermeable/S. Atlantic/Permeable/Adjustable/System/
Artificial-fill/Timber/Concrete/Structural-design/

"Some Coastal Engineering Problems in India"
Joglekar, D. V., Gole, C. V., and
Apte, A. S., Proceedings of Sixth Conference
on Coastal Engineering, Council on Wave
Research of the Engineering Foundation, Dec.,
1957, pp. 510-519. (TC203 .C6)

5712GR0002

A section of coastline on the southern tip of India was subject to increasing amounts of erosion. A breakwater and an 11-element impermeable groin system were constructed as an experiment. Laboratory model experiments were also made. Observation of the structures in field and laboratory led to proposed advantageous construction of protective structures along other parts of shoreline where erosion was eminent.

Key Words - Experimental/Field/Rubble-mound/System/Misc-plan/
Accretion/Asia/Model/Structural-design/Long/Impermeable/
Erosion/Scour/

"The Origin and Stability of Beaches"
Hoyle, J. W., and King, G. T., Proceedings
of Sixth Conference on Coastal Engineering,
Council on Wave Research of the Engineering
Foundation, Dec., 1957, pp. 281-301.
(TC203 .C6)

5712GR0003

Compression of wet or "running sand" can be produced by correctly designed groins, resulting in the stabilization of beaches. According to the authors, groins must be impermeable, substantial in construction so that they can withstand the longitudinal thrust of stabilized beach material, and high and long enough so that beach material will not be lost over or around them.

Key Words - Impermeable/Long/High/Theory/

"Palm Beach County from Lake Worth Inlet
to South Lake Worth Inlet, Florida, Beach
Erosion Control Study"

5712GR0004

Key Words - House Document/Not Annotated/

"Biological Help in Coastal Protection" 5800GR0001
Bulow, K., Wasserwirtschaft-
Wassertechnik, Berlin, Vol. 8, No. 2,
pp. 54-63.

Key Words - Not Annotated/

"Schutz und Entwässerung der Niederungs- 5800GR0002
gebiete an der Schleswig-Holsteinischen
Ostseeküste"
Kannenbert, E. G., Die Küste, Kiel, West
Germany, Vol. 7, No. 1, 1958/1959, pp.
47-106. (GB457.5 .K97) (Not Translated)

Translated Title: "Protection and Drainage of Depressed Areas
of the Schleswig-Holstein Baltic Sea Coast"

Key Words - Not Annotated/

"Dune Protective Works on Sylt" 5800GR0003
Lamprecht, H., Bautechnik, Berlin, Vol. 35,
No. 1, 1958, pp. 16-20.

Key Words - Not annotated/

"Basic Coastal Model" 5800GR0004
Anonymous, Hydraulics Research 1957,
Department of Scientific and Industrial
Research, Her Majesty's Stationery Office,
London, 1958, pp. 52-54. (TC158 .G7
G786b)

Experimental study on groins shows: (1) High, impermeable groins
closely spaced trapped greatest amount of material; (2) no loss of
sand occurred if sand built up to the top of the groins; (3) low,

widely spaced groins are to be preferred, and (4) permeable groins had little influence on longshore transport.

Key Words - System/Transport-normal/Model/High/Impermeable/Low/Misc-plan/Permeable/Rubble-mound/Experimental/Erosion/Accretion/

Water Economy between North Sea and
Baltic Sea, 1948-58
Rieder, K., and Suhr, H., Kiel, 1958.

5800GR0005

Key Words - Not Annotated/

Manuel of Water Economy
Press, H., Hamburg, 1958.

5800GR0006

Key Words - Not Annotated/

"Swell and Surge as Basis for Planning
and Design in Sea Structures and Coastal
Protection"
Magens, C., Proceedings of the Testing
Institute of Hannover, No. 14, 1958.

5800GR0007

Key Words - Not Annotated/

"Thames River to Niantic Bay, Conn.,
Beach Erosion Control Study"
U. S. Army Corps of Engineers, House
Document No. 334, 85th Congress, 2nd
Session, Jan., 1958.

5801GR0001

Key Words - House Document/Not Annotated/

"Berrien County, Michigan, Beach Erosion
Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 336, 85th Congress, 2nd Session,
Feb., 1958.

5802GR0001

Key Words - House Document/Not Annotated/

"Shore of New Jersey from Sandy Hook To
Barnegat Inlet, Beach Erosion Control
Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 332, 85th Congress, 2nd Session,
Feb., 1958.

5802GR0002

Key Words - House Document/Not Annotated/

"Feeder Beaches and Groins Restore Presque
Isle Peninsula"
Omstead, L. W., and Lynde, G. A., Civil
Engineering, ASCE, Vol. 28, No. 3, Mar.,
1958, pp. 172-175.

5803GR0001

Since 1819 Presque Isle Peninsula, Pennsylvania, has been subjected to increasing amounts of erosion. A program involving placement of fill, and construction of bulkheads and groins was started in 1955 to restore the peninsula and combat erosion.

Key Words - Erosion/Great Lakes/Artificial-fill/System/Field/
Experimental/Steel/Misc-plan/Concrete/Economics/1955-1959

"South Kingstown and Westerly, R. I.,
Beach Erosion Control Study"
U. S. Army Corps of Engineers, House
Document No. 30, 86th Congress, 1st
Session, Sept., 1958.

5809GR0001

Key Words - House Document/Not Annotated/

"An Experimental Study on the Effect of
Coastal Groins"
Horikawa, K., and Sonu, C., Coastal
Engineering in Japan, Committee of
Coastal Engineering, JSCE, Vol. 1, Oct.,
1958, pp. 59-74. (TC203 .C652)

5810GR0001

This report was not designed to present design formula for groins, but points out that flow patterns in the vicinity of groins are far

more complicated than has generally been realized. Along with analysis of flow patterns, characteristics of sand movement around groins are discussed.

Key Words - Erosion/Scour/Accretion/Impermeable/Permeable/Low/
Adjustable/Misc-plan/System/Experimental/Model/Single/
Theory/

"Summary Statement Concerning Importance
of a Groin Design Criterion"

5810GR0002

Wicker, C. F., Seminar on Groins at
Princeton, N. J., ASCE Sponsored, Oct.,
1958, 2 pp., Unpublished.

At the updrift lip of an inlet or at the updrift side of a submarine canyon, it is desirable to trap and conserve all of the supply of sand. To do this, a groin must be long, high, and impermeable. Writer believes that these are the only situations where such a structure is desirable.

Key Words - Impermeable/Structural-design/Erosion/Accretion/High/
Long/Low/

"Motion of Sand Particles Between Groins"
Nagai, S., and Kubo, H., Journal of Water-
ways and Harbors Division, ASCE, Vol. 84,
No. WW5, Paper 1876, Dec., 1958, 28 pp.

5812GR0001

Experiments on the motion of sand particles between groins were performed in a fixed basin to compare with the results of groins in a movable bed. The comparison proved that both results were in comparatively good agreement. Experimental results were found for beaches without groins, with single groins, with a groin system, with various groin spacing, and different angle of wave incidence.

Key Words - Experimental/Single/System/Theory/Misc-plan/Model/
Impermeable/

"Protecting Our Shore Line"

5812GR0002

Brater, E. F., Consulting Engineer, Vol.
11, No. 6, Dec., 1958, pp. 92-96.

Among various shore protection methods, author briefly discusses

groin systems, maintaining that they should be impermeable. Spacing and length of groins are considered.

Key Words - Great Lakes/Rubble-mound/Timber/Impermeable/Low/Field/
High/Short/Artificial-fill/System/

"Model Investigations of Harbor Inlet Siltling" 5900GR0001

Blau, E., Wasserwirtschaft-Wassertechnik,
Berlin, Vol. 9, 1959, pp. 244-251.

Key Words - Not Annotated/

"Groins with Asphalt Grout in East Friesian Coast Region" 5900GR0002

Jansen, T., Bitumen, Heidelberg, No. 3,
1959.

Key Words - Not Annotated/

"Littoral-Drift Problem at Shore-Line Harbors" 5900GR0003

Johnson, J. W., Transactions of the
American Society of Civil Engineers,
Vol. 124, Paper No. 2992, 1959, pp.
525-555.

Structures protecting California's harbors have interrupted the littoral drift. These structures often act as complete barriers causing sediment to be trapped. Examples are Santa Barbara, Camp Pendleton, and Santa Monica.

Key Words - California/Accretion/Field/

"Receding of Shoreline at Cochin by Groynes and a Seawall" 5900GR0004

Anonymous, 1959, Central Water and Power
Research Station Poona, Poona, India,
Annual Research Memoirs, Ministry of Irrigation
and Power, pp. 283-287. (TC158 .I4 I39a)

Effects of a 10-element groin system near Cochin, India during 1956-1957 are discussed.

Key Words - System/Asia/1955-1959/1950-1954/Impermeable/

"Sea Defence Groynes"

5900GR0005

Oliver, A. C., and Richardson, H.,
Timber Development Association, London,
1959.

Key Words - Not Annotated/

Cultivated Land Conservation and
Reclamation

5900GR0006

Press, H., Berlin and Hamburg, 1959.

Key Words - Not Annotated/

"Better Jetty for Less Money"

5903GR0001

Reed, T. M., Municipal Construction,
Mar., 1959. (V.F. 19 3/59)

Asphalt-coated, corrugated, metal sheets were used to construct a jetty at Savannah Beach, Georgia. Use in the construction of groins is promoted.

Key Words - Asphalt/Steel/S. Atlantic/1955-1959/Const-procedure/
Economics/

"Coastal Engineering Study at Pompano
Beach"

5903GR0002

Bruun, P., Mar., 1959, Unpublished Report
Prepared for the City of Pompano Beach,
Florida, Coastal Engineering Laboratory,
University of Florida, Gainesville.
(TC233.5 .F64)

The coastal protection situation (1959) at Pompano Beach, Florida, including groin structures is discussed.

Key Words - Impermeable/Short/Adjustable/High/Low/Erosion/Accretion/

Schijf, J. B., Journal of the Waterways and Harbors Division, ASCE, Vol. 85, No. WW1, Pt. 1, Mar., 1959, pp. 1-12.

The engineering basis of coastal protection is discussed with emphasis on the Netherlands seacoast. The paper supports a shift in the old philosophy of protection by groins and seawalls to a new philosophy of protection by sand fill.

Key Words - System/Low/Terminal/Artificial-fill/Europe/

"Unfinished Business - New Jersey Groin Project Stalled by Winter"

5904GR0001

Anonymous, Asphalt Institute Quarterly, Apr., 1959, pp. 7-8. (V.F. 928 4/59)

Three types of structural designs used in the construction of asphalt groins are presented along with a commentary on construction procedures.

Key Words - Low/Structural-design/Const-procedure/S. Atlantic/
N. Atlantic/Impermeable/Asphalt/

"Behavior of Sand-Asphalt Groins at Ocean City, Maryland"

5905GR0001

Jachowski, R. A., U. S. Army Beach Erosion Board Miscellaneous Paper, No. 2-59, Washington, D. C., May, 1959. (BEB M.P. 2-59)

Maryland north from Ocean City to Delaware has had a history of erosion over the past century. In 1954 and 1955 the Maryland State Roads Commission desired to stabilize this shore, and with limited funds available decided to experiment with sand-asphalt construction for a groin system. Construction procedure, the behavior of the beach and groins are discussed; illustrative and photographic coverage included. Subsequent surveys showed that the groins were repeatedly undermined and settled or were destroyed. Net effect of the entire groin system at the end of 3 years was negligible.

Key Words - 1950-1954/1955-1959/Asphalt/Field/System/Low/Impermeable/
N. Atlantic/Erosion/Misc-plan/Scour/Accretion/Const-procedure/Structural-design/

"Laboratory Study of the Effect of Groins
on the Rate of Littoral Transport: Equip-
ment Development and Initial Tests"
Savage, R. P., U. S. Army Beach Erosion
Board Technical Memorandum, No. 114, June,
1959, 56 pp.

5906GR0001

Waves were generated to impinge obliquely on a sand beach in an outdoor wave test basin. Longshore movement of sand due to wave action, with and without groins, was measured. Procedures and equipment for trapping, measuring and transporting entrapped sand to the updrift end of the beach are described. Test results, such as cumulative weight of sand movement relative to test duration, relative weight of sand trapped in different profile zones and physical changes to profile and bottom contours, are graphically presented. Rate of sand movement relative to applied wave energy is compared with values obtained by other investigators. Rates determined from small-scale laboratory data fall below an extrapolated curve derived from data from field tests. No positive conclusions are drawn; further testing is underway.

Key Words - Experimental/Model/System/ERosion/Accretion/Impermeable/

"Shore of New Jersey - Barnegat Inlet to
Cape May Canal, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 208, 86th Congress, 1st Session,
Aug., 1959.

5908GR0001

Key Words - House Document/Not Annotated/

"Shore Between Pemberton Point and Cape
Cod Canal, Mass., Beach Erosion Control
Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 272, 86th Congress, 2nd Session,
Oct., 1959.

5910GR0001

Key Words - House Document/Not Annotated/

"Coast Erosion and Defence"
Russell, R. C. H., Department of Scien-
tific and Industrial Research Hydraulics

6000GR0001

Among nine questions and answers on coast erosion and defense, these are especially pertinent to groins: (1) how should the designer decide whether or not groins are desirable in a particular case, and how should he decide on the spacing, length, height, profile, and orientation? (2) what are the relative merits of permeable and impermeable groins? (3) what causes lee side scour, and how should the problem be dealt with by the designer of sea defenses?

Key Words - Model/Experimental/Europe/Accretion/Misc-plan/Low/Short/
System/Erosion/Scour/Artificial-fill/Mobbs/Permeable/
Impermeable/1960-1964/

"Protection of the West Beach of Sylt Island by Flat Groins" 6000GR0002
Zischer, F. F., Bitumen, Heidelberg, No.
8/9, 1960, p. 190.

Key Words - Not Annotated/

"Wessagussett Beach, Weymouth, Mass." 6002GR0001
U. S. Army Corps of Engineers, House
Document No. 334, 86th Congress, 2nd
Session, Feb., 1960.

Key Words - House Document/Not Annotated/

"A Contractor Battles the Tides" 6004GR0001
Eastburn, H. C., Shore and Beach,
American Shore and Beach Preservation
Assoc., Vol. 28, No. 1, Apr., 1960,
p. 29. (TC330 .Am3)

Repair and extension of groins at Bethany Beach, Delaware, were undertaken by a low-bid company. Construction procedures and cost of construction are presented.

Key Words - N. Atlantic/Artificial-fill/System/Erosion/Timber/Steel/
Rubble-mound/Economics/Const-procedure/Maintenance/1955-
1959/1960-1964/Impermeable/Accretion/

"Scale Effects in Models with Littoral Sand-Drift"

6008GR0001

Reinalda, R., Proceedings of Seventh Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Aug., 1960, pp. 318-325.
(TC203 .C6)

Erosion problems around the Thyboron Channel on the west coast of Denmark were studied in models. Analogs and differences between actual field history and model studies of erosion and accretion due to groin construction are presented.

Key Words - Model/Experimental/Field/Erosion/Accretion/Scour/Construction problems/1900-1949/Europe/Long/1960-1964/

"The Development of Coastal Profiles on a Receding Coast Protected by Groynes"
Sorensen, T., Proceedings of the Seventh Conference on Coastal Engineering, ASCE, Aug., 1960, Vol. 2, pp. 836-846.
(TC203 .C6)

6008GR0002

This paper analyzes the longshore sand transport by waves and currents on natural coasts outside the breaker zone. A tentative expression for the transport capacity is established and applied to the problem of the effect of groins on the development of the coast profiles. It is shown that results are consistent with observed development of the Danish North Sea Coast at Thyboron, which has been protected by groins and closely observed for 60 years.

Key Words - Theory/Field/System/Transport-normal/Europe/Erosion/

"Shoreline Advancement by Sea Wall and Groynes at Cochin"
Hiranandani, M. G., and Gole, C. V., Proceedings of the Seventh Conference on Coastal Engineering, Vol. 2, Aug., 1960, pp. 860-871. (TC203 .C6)

6008GR0003

This report on the groins and seawall at Cochin, India, presents the following conclusions: (i) Groins 200 feet long are to be preferred to groins 150 feet long. (ii) Spacing between groins should not exceed three times the groin length. (iii) Heavy stones, used as seawall armor on a core of smaller stones, result in decreased rate of maintenance. (iv) Piles at toe of seawall do not give extra protection

to the seawall. (v) Inclined groins do not commend themselves for adoption on this coast.

Key Words - Rubble-mound/Piling/Permeable/Impermeable/System/Misc-plan/Const-procedure/Erosion/Short/Accretion/1955-1959/Field/Model/

"Coastal Protection Works and Related Problems in Japan"

6008GR0004

Hom-ma, M., and Horikawa, K., Proceedings of the Seventh Conference on Coastal Engineering, Council on Wave Research of the Engineering Foundation, Aug., 1960, pp. 904-930. (TC203 .C6)

This extensive discussion of coastal engineering in Japan includes a survey of the types of protective works, including groins.

Key Words - Asia/Field/Concrete/Short/

"Beach-Rehabilitation by use of Beach Fills and further Plans for the Protection of the Island of Norderney"

6008GR0005

Kramer, J., Proceedings of the Seventh Conference on Coastal Engineering, ASCE, Aug., 1960, Vol. 2, pp. 847-859. (TC203 .C6)

This paper discusses the placement of artificial nourishment on a heavily groined beach on the island of Norderney, Germany. Changes in beach profiles are given following the 1951-1952 filling operation. Also presented is a plan for future fill operations.

Key Words - System/Erosion/Artificial-fill/Field/Europe/1950-1954/

"San Diego County, Calif., Appendix IV, Phase 2, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 456, 86th Congress, 2nd Session, Sept., 1960.

6009GR0001

Key Words - House Document/Not Annotated/

"Design and Construction of the Seal
Beach Groin"

6010GR0001

Nicol, F. E., Shore and Beach, American
Shore and Beach Preservation Assoc.,
Vol. 28, No. 2, Oct., 1960, pp. 24-26.
(TC330 .Am3)

Due to increased deterioration of Seal Beach, California, state and federal aid was recommended by the Corps of Engineers. A single groin, deemed the most economical solution, was constructed.

This concise, though comprehensive, article presents the structural design, constructive procedure, and an especially pertinent conclusion enumerating construction and engineering problems.

Key Words - Single/Impermeable/Concrete/Artificial-fill/Structural-
design/Erosion/Const-procedure/Accretion/Timber/Piling/
Const-problems/California/1955-1959/1960-1964/Field/

"Coastal Protection in Massachusetts"

6010GR0002

MacKinnon, R. B., and Hannon, J. R.,
Shore and Beach, American Shore and Beach
Preservation Assoc., Vol. 28, No. 2, Oct.,
1960, pp. 37-38. (TC330 .Am3)

Spur groins constructed normal to jetties on the updrift side near the low water line were successful in stopping scour along the jetties. In a short time, the foreshore built out to where the spur was placed. Author points out these groins may not be a solution for all similar instances.

Key Words - Rubble-mound/Erosion/Accretion/Impermeable/Misc-plan/
N. Atlantic/Field/1960-1964/Short/Scour/Spur/

"Über den Einfluss von Strandbuhnen auf
die Sandwanderung an Flachküsten"

6100GR0001

Gutsche, H., Mitteilungen des Franzius-
Instituts für Grund- und Wasserbau der Tech-
nischen Hochschule Hannover, Vol. 20,
1961, pp. 74-211.

Translated Title: "On the Influence of Groins on Sand Movement
along Low-Lying Coasts"

Key Words - Not Annotated/

"A Scientific Basis for Design of Groyne Systems"

6100GR0002

Hoyle, J. W., and King, G. T., The Surveyor, and Municipal and County Engineer, London, Vol. 120, 1961, pp. 619-621.

Key Words - Not Annotated/

"Sea Defence Groynes - 4"

6101GR0001

Oliver, A. C., Civil Engineering, London, Vol. 56, No. 654, Jan., 1961, pp. 87-90.

Key Words - Not Annotated/

"Lake Erie Shore Line from the Michigan-Ohio State Line to Marblehead, Ohio, Beach Erosion Control Study"

6101GR0002

U. S. Army Corps of Engineers, House Document No. 63, 87th Congress, 1st Session, Jan., 1961.

Key Words - House Document/Not Annotated/

"Behavior of Beach Fills in New England"

6102GR0001

Perdikis, H. S., Journal of the Waterways and Harbors Division, ASCE, Vol. 89, No. WW1, Paper No. 2744, Feb., 1961.

A study of behavior of fills placed on 10 New England beaches is presented. Quantitative determinations of changes in volumes of the fill, high and low water shoreline positions, and slopes were made. Groins, single and in systems, were built to help retain fill.

Key Words - N. Atlantic/Artificial-fill/Impermeable/Rubble-mound/
Erosion/Accretion/Single/System/Field/

"Groins on the Shores of the Great Lakes"

6105GR0001

Lee, C. E., Journal of the Waterways and Harbors Division, ASCE, Vol. 87, No. WW2, Paper 2819, May, 1961, pp. 89-111.

Groins are not a cure-all for shore erosion problems; faulty design or misplacement can create additional problems or increase existing problems. This comprehensive paper summarizes data on existing groins, changes in lake levels, other processes, notes on design of groins for the Great Lakes, and some indication of research and costs.

Key Words - Great Lakes/Permeable/Impermeable/Concrete/S. M. Wood/
Timber/Steel/Piling/Rubble-mound/Misc-plan/Geometric-
shapes/System/T-groins/Scour/Economics/Field/1960-1964/
Structural-design/

"Palm Beach County, Florida, from Martin
County Line to Lake Worth Inlet and from
South Lake Worth Inlet to Broward County
Line, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 164, 87th Congress, 1st Session,
May, 1961. 6105GR0002

Key Words - House Document/Not Annotated/

"New Jersey Coast of Delaware Bay from Cape
May Canal to Maurice River, Beach Erosion
Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 196, 87th Congress, 1st Session,
June, 1961. 6106GR0001

Key Words - House Document/Not Annotated/

"Amelia Island, Florida, Beach Erosion
Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 200, 87th Congress, 1st Session,
June, 1961. 6106GR0002

Key Words - House Document/Not Annotated/

"Coast Protection -- Groynes"
Hoyle, J. W., and King, G. T., Journal of the
Institution of Municipal Engineers, Vol. 88,
No. 6, June, 1961. 6106GR0003

Key Words - Not Annotated/

"A Study of Groins and Their Function as
Hydraulic Structures"
Pretious, E. S., and Vollmer, E., Technical 6107GR0001

Note No. 35, Department of Civil Engineering, University of British Columbia, Vancouver, Canada, July, 1961. (TC426.B2tn)

In a systematic laboratory model study of groin structures, lengths, crest heights and slopes, shapes and slopes of groin heads, side slopes, ratios of groin spacings to lengths, ratios of crest heights to water depths, angles of inclination to the waterline, and various degrees of permeability of groins were investigated. All results are fully illustrated and qualitative.

Key Words - Experimental/Model/Terminal/System/Scour/Erosion/
Accretional/Shoaling/Structural-design/Single/Misc-plan/
T-groins/Long/Short/Permeable/Impermeable/L-groins/Theory/

"Behavior of Beach Fill and Borrow Area
at Prospect Beach, West Haven, Connecticut"
Vesper, W. H., U. S. Army, Beach Erosion
Board Technical Memorandum, No. 127, Aug.,
1961, 29 pp. 6108GR0001

Comparative survey and sample data are analyzed to determine behavior of beach fill obtained from an offshore borrow source. A groin system and feeder beach were also included in the project. The project has provided a protective beach over a 3-year period equal to or greater than minimum dimensions required. Average annual losses have been about 13,000 cubic yards per year, and the feeder beach has performed satisfactorily. Size and sorting characteristics of the fill material are shown to have been suitable, using Krumbein's method of computed composite curves. Borrow sources, although only 1,000 feet offshore, were suitable for local wave conditions, and shoaling thereof has been limited to silty material. Annual costs have been about \$3.00 per linear foot of shore protected. The groins are effective and have probably reduced fill losses to a degree justifying their construction.

Key Words - N. Atlantic/System/Misc-plan/Accretion/Economics/Rubble-
mound/Impermeable/Field/Low/Long/1955-1959/

"Groins on the Shores of the Great Lakes"
Rayner, A. C., and Rector, R. L., Journal
of the Waterways and Harbors Division, ASCE,
Vol. 87, No. WW4, Nov., 1961, p. 137. 6111GR0001

The authors state that use of permeable groins is not warranted along the Great Lakes because of the deficiency of littoral drift along those shorelines. This short article provides insight on groin

costs, length, and percentage of permeable to impermeable groins on the Great Lakes.

Key Words - Permeable/Impermeable/Short/Long/Economics/Great Lakes/
Artificial-fill/1960-1964/

"The Selsey Coast Protection Scheme"

6112GR0001

Duvivier, J., Journal of the Institution
of Civil Engineers, London, Vol. 20, Dec.,
1961, pp. 481-506. (TC257 .D2)

Because of threatening erosion or inundation or both, a scheme was undertaken to construct protective structures, including groins, on the coast east and west of Selsey Bill, England. This paper gives the history of erosion, trends of littoral transport and currents, sediment supply sources, scheme of protective works, and results after construction.

A new type of articulated groin built with transverse and longitudinal flexibility is discussed, and its satisfactory performance noted. Measures taken to combat erosion beyond the terminal groin are presented.

Key Words - Terminal/Concrete/System/Europe/Piling/Accretion/Erosion/
Field/Timber/1950-1954/1955-1959/1960-1964/Impermeable/
misc-plan/Structural-design/Scour/Maintenance/

"Beach Erosion and Protection Works in
Imazu-Sakano Beach"

6112GR0002

Kubo, M., and Iwasa, N., Coastal Engineer-
ing in Japan, JSCE, Vol. 4, Dec., 1961,
pp. 103-114.

This article presents the design of protective structures including T-groins constructed of concrete hexa-leg blocks at Imazu-Sakano Beach, Japan.

Key Words - Impermeable/Asia/Concrete/T-groins/Transport-normal/
Structural-design/Misc-plan/System/Economics/Geometric-
shapes/

"Photographs of Sarasota County, Florida,
Showing Groin Installation"

6200GR0001

Budd, W., 1962, Unbound collection. (V.S. 1772)

Photos show a Sarasota County, Florida beach before and after construction of Budd dog-bone groins, 1961-1962.

Key Words - Budd/Photographic/S. Atlantic/Permeable/

"Behavior of Beach Fills in New England" 6200GR0002
Perdikis, H. S., Transactions of the
American Society of Civil Engineers, Vol.
127, Part 4, Paper No. 3337, 1962, pp.
292-328.

A study of the behavior of fills placed on 10 New England beaches is presented. Quantitative determinations of changes in volumes of the fill, high and low water line positions, and beach slopes were made. The groins, in systems and singly, were either pre-existing or built to help retain the fill.

Key Words - N. Atlantic/Artificial-fill/Impermeable/Rubble-mound/
Erosion/Accretion/Single/System/Field/

"Groynes as Barriers to Movement of Beach 6200GR0003
Material"
Hoyle, J. W., and King, G. T., The Surveyor,
and Municipal and County Engineer, London,
Vol. 121, 1962, pp. 601-603.

Key Words - Not Annotated/

"Belle Pass to Raccoon Point, Louisiana, 6202GR0001
Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 338, 87th Congress, 2nd Session,
Feb., 1962.

Key Words - House Document/Not Annotated/

"Asphalt Groins" 6204GR0001
Asphalt Institute, Asphalt in Hydraulic
Structures, 3rd ed., Manual Series No. 12,
Apr., 1962, pp. 95-103. (TN853 .A4)

Structural design features and modes of construction are presented.

Key Words - Asphalt/Low/Short/Const-procedure/Structural-design/
Impermeable/

"Use of Concrete for Shore Protection" 6204GR0002
Sellner, E. P., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
30, No. 1, Apr., 1962, pp. 18-24.
(TC330 .Am3)

A general discussion of groins is included in this article. Groin design, purpose, spacing and length are discussed. Decision factors as to whether or not to use groins are presented.

Key Words - Impermeable/Permeable/Concrete/Great Lakes/Structural-
design/Geometric-shapes/Single/Field/Erosion/Accretion/
1960-1964/

"Asphalt in Beach Erosion Control Structures" 6204GR0003
Smith, D., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
30, No. 1, Apr., 1962, pp. 31-34.

Hot-mix asphalt concrete specifications for groins are discussed. Examples of a typical cross-section and plan are given. Suggested construction procedures and basic considerations for asphaltic groin design are presented.

Key Words - Asphalt/Low/Short/Const-problems/Misc-plan/Structural-
design/N. Atlantic/Const-procedures/1960-1964/Impermeable/

"Coast Protection - Groyne Systems" 6204GR0004
Hoyle, J. W., and King, G. T., Surveyor
and Municipal and County Engineer, London,
Vol. 121, No. 3647, Apr., 1962, pp. 575-
579. (TC535 .H9)

Relationship between high water lines, groin spacing, and profile of a groin system is demonstrated experimentally. The results of this procedure were used in the construction of a groin system on the Norfolk coast, England.

This article suggests that design criteria for groin systems can be determined through experimental analysis. The design of a groin system should be carried out in two operations, that relating to the spacing and location upon the plan, and that relating to the shape and levels of the profile.

Key Words - Experiment/Theory/Field/Europe/System/Permeable/High/
Low/Short/Long/Structural-design/Impermeable/Accretion/
Erosion/1955-1959/1960-1964/

"Virginia Beach, Virginia, Cooperative Beach Erosion Control Study" 6204GR0005
U. S. Army Corps of Engineers, House Document No. 382, 87th Congress, 2nd Session, Apr., 1962.

Key Words - House Document/Not Annotated/

"Shore of Sheffield Lake Community Park, Ohio, Beach Erosion Control Study" 6205GR0001
U. S. Army Corps of Engineers, House Document No. 414, 87th Congress, 2nd Session, May, 1962.

Key Words - House Document/Not Annotated/

"Carolina Beach and Vicinity, North Carolina" 6205GR0002
U. S. Army Corps of Engineers, House Document No. 418, 87th Congress, 2nd Session, May, 1962.

Key Words - House Document/Not Annotated/

"Shore of the State of New Hampshire Beach Erosion Control Study" 6205GR0003
U. S. Army Corps of Engineers, House Document No. 416, 87th Congress, 2nd Session, May, 1962.

Key Words - House Document/Not Annotated/

"A Model Study of the Behavior of Beaches
and Groynes"
Kemp, P. H., Journal of the Institution
of Civil Engineers, London, Vol. 22,
1962, pp. 191-210. (TCS35 .K4)

6206GR0001

This paper reviews factors which influence the shape of the natural shoreline in the absence of groins. A series of model experiments is then described; three types of impermeable groins were subjected to a cycle of accretion, depletion, and recovery, under the action of waves of different characteristics. Attention is drawn to the effect of the alignment and type of groin on the rate of longshore transport, littoral currents, scour, and shoreline orientation. Each arrangement of the groins is seen to possess characteristic advantages and disadvantages which can influence the choice of groin and its alignment in given circumstances. Within the limitations of the groin experiments it would seem that the shoreline orientation and rate of longshore transport can be varied by modifications to groin type and alignment. Shoreline reorientation can reduce the littoral current and consequently reduce the scour. By an appropriate choice of groin type and alignment, it should be possible to orient the shoreline in such a way that the effects of storm attack are reduced.

Key Words - Experimental/Model/Accretion/ERosion/Transport-normal/
Scour/Structural-design/High/Low/System/Long/Short/
Impermeable/

"Coast of Southern California - Special
Interim Report on the Ventura Area,
Cooperative Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Docu-
ment No. 458, 87th Congress, 2nd Session,
June, 1962.

6206GR0002

Key Words - House Document/Not Annotated/

"Raritan Bay and Sandy Hook Bay, New Jersey"
U. S. Army Corps of Engineers, House Docu-
ment No. 464, 87th Congress, 2nd Session,
June, 1962.

6206GR0003

Key Words - House Document/Not Annotated/

"The Nearshore Movement of Sand at Durbin"

6207GR0001

Kinmont, A.; U. S. Army Beach Erosion
Board Bulletin, Vol. 16, July, 1962,
pp. 22-23. (BEB Vol. 16)

The impermeability of groins at Durbin, South Africa, have caused sand at their ends to be eroded. Due to an increase of water depth at their ends, the normal gradients of the beach have been disturbed. Instead of accumulating on the southern face of the groin - the littoral transport being northerly - the sand is forming a central spit, while the areas on both sides of the groins are being severely eroded.

Key Words - Africa/Field/Erosion/Accretion/Impermeable/System/
1950-1954/1955-1959/Scour/

"The Protection and Preservation of the
Atlantic Shore Front of the State of
New York" 6207GR0002

Anonymous, Final Report, July, 1962, State
of New York Temporary State Commission on
Protection and Preservation of the
Atlantic Shore Front.

Recurring hurricanes and seasonal storms have caused destruction along the Atlantic shoreline of New York State. Shore protection measures, including groin systems, are reviewed.

Key Words - System/Photographic/N. Atlantic/Erosion/Accretion/

"Aerial Photographs, Plum Island,
Massachusetts" 6208GR0001
U. S. Army Corps of Engineers, Aug., 1962,
New England Division, Unpublished Report.
(V.F. 1772 8/62)

Seventeen 8- by 10-inch oblique aerial photographs showing the August 1962 condition of the Plum Island jetty and a four-component rubble-mound groin system.

Key Words - N. Atlantic/Photographic/Field/System/Rubble-mound/
Impermeable/1960-1964/

"San Juan, Puerto Rico, Beach Erosion
Control Study" 6209GR0001

U. S. Army Corps of Engineers, House
Document No. 575, 87th Congress, 2nd Session,
Sept., 1962.

Key Words - House Document/Not Annotated/

"Fort Macon - Atlantic Beach and Vicinity,
North Carolina"

6209GR0002

U. S. Army Corps of Engineers, House Docu-
ment No. 555, 87th Congress, 2nd Session,
Sept., 1962.

Key Words - House Document/Not Annotated/

"Clark Point, New Bedford, Massachusetts,
Beach Erosion Control Study"

6209GR0003

U. S. Army Corps of Engineers, House Docu-
ment No. 584, 87th Congress, 2nd Session,
Sept., 1962.

Key Words - House Document/Not Annotated/

"Beach Erosion Control Report on Cooperative
Study of Virginia and Biscayne Keys, Florida"

6209GR0004

U. S. Army Corps of Engineers, House Docu-
ment No. 561, 87th Congress, 2nd Session,
Sept., 1962.

Key Words - House Document/Not Annotated/

"Sheet Steel Piling for Shore Protection
Structures"

6210GR0001

Hickey, R. E., Shore and Beach, American
Shore and Beach Preservation Assoc., Vol.
30, No. 2, Oct., 1962, pp. 18-22.

Design and examples of shore protection structures, including groins, constructed with sheet steel piling are presented. Some structures are built with a combination of materials. For instance, parallel walls of sheet steel piling may be filled with rock and capped with concrete.

Key Words - Steel/Piling/Misc-plan/Concrete/Rubble-mound/Great Lakes/
Structural-design/Impermeable/

"San Gabriel River to Newport Bay, Orange County, California, Appendix V, Phase II, Beach Erosion Control Study"
U. S. Army Corps of Engineers, House Document No. 602, 87th Congress, 2nd Session, Oct., 1962.

6210GR0002

Key Words - House Document/Not Annotated/

Review of Beach Erosion and Storm Tide Conditions in Florida 1961-1962"
Bruun, P., Morgan, W. H., and Purpura, J. A., Engineering Progress at the University of Florida, Vol. 16, No. 11, Tech. Progress Report No. 13, Nov., 1962, Florida Engineering and Industrial Experiment Station, Gainesville, 104 pp. (TC203 .F62 V. 16 no. 11)

6211GR0001

A pictorial review of erosion and Florida beach conditions shows that groins have caused serious downdrift erosion. Examples are cited.

Key Words - Photographic/S. Atlantic/Timber/Impermeable/Permeable/
Erosion/Artificial-fill/System/Field/Rubble-mound/Budd/
Adjustable/Concrete/Piling/High/Low/Accretion/

"An Investigation into the Effectiveness of Various Types of Groynes on Seaford Beach"
Anonymous, Report No. EX218, 1963, Wallingford, Berkshire, England. (TC57 W34r For Official Use Only)

6300GR0001

Key Words - Not Annotated/

"Construction Works for the Protection of the Coasts"
Spataru, A., Studii de Hidraulica, Comitetul de stat al Apelor Institutul de

6300GR0002

Several types of constructions for the protection of the coast are presented with information concerning permeable and impermeable transverse structures. (In Romanian with an English abstract.)

Key Words - Permeable/Impermeable/

"Aerial Photographs of Wallis Sand State
Beach, Rye, New Hampshire"
U. S. Army Corps of Engineers, June, 1963,
New England Division, Unpublished Reprint.
(V.F. 1772 9/12/63)

Six ground photos show construction stages of a stone groin.
Three oblique aerial photographs show the completed groin.

Key Words - 1960-1964/Single/Field/Long/High/Rubble-mound/
N. Atlantic/Impermeable/Photographic/

"Emergency Measures to Combat Beach Erosion" 6306GR0002
Bruun, P., and Purpura, J. A., Engineering
Progress at the University of Florida, Vol.
17, No. 6, Leaflet No. 158, June, 1963,
Florida Engineering and Industrial Experiment
Station, Gainesville, 26 pp. (TC203
.F62 v. 17 no. 6)

Among the emergency measures, the repair of groins damaged
during storm action is discussed.

Key Words - Scour/Erosion/Maintenance/Artificial-fill/Adjustable/
Rubble-mound/Piling/

"Coastal Engineering Structures" 6307GR0001
Hall, J. V., Jr., U. S. Army Beach Erosion
Board Annual Bulletin, Vol. 17, July, 1963,
pp. 16-37. (BEB Vol. 17)

This paper describes the physical characteristics of basic
coastal engineering structures in general use; the behavior of individual
structures and their behavior when grouped as a system. Also

described is a typical example of planning for coastal engineering works.

Groin structures are defined, the different types and their uses discussed; structural design and examples are given.

Key Words - Timber/Concrete/Steel/Rubble-mound/Structural-design/
Low/Permeable/Impermeable/High/Long/Short/Single/System/
N. Atlantic/Field/Accretion/Erosion/Terminal/Texas Gulf/

"Review of German Experience on Coastal
Protection by Groins"

6307GR0002

Petersen, M., U. S. Army Beach Erosion
Board Annual Bulletin, Vol. 17, July,
1963, pp. 38-54. (BEB Vol. 17)

This report contains sections on the evaluation of German documentation on groins, a chronologic survey of the literature prior to 1960, the effects of groins through experience, and a bibliography on German literature on groins.

Key Words - 1900-1949/1950-1954/1955-1959/1960-1964/Misc-plan/System/
Timber/Piling/Steel/Rubble-mound/Concrete/Asphalt/
Economics/

"Structures for Shore Protection"

6307GR0003

Hall, J. V., Civil Engineering, ASCE,
Vol. 33, No. 7, July, 1963, pp. 38-41.

The most widely used and the best solution to the beach erosion problem is the artificially constructed and nourished beach. Groins are the most important structures for enlargement and stabilization of beaches.

Key Words - Permeable/Impermeable/Low/High/System/Artificial-fill/

"Coastal Protection for Florida"

6310GR0001

Bruun, P., and Manohar, M., Engineering
Progress at the University of Florida,
Bulletin Series No. 113, Vol. 17, No. 8,
Aug., 1963, Engineering and Industrial
Experiment Station, Gainesville, 56 pp.
(TC203 .F62 v. 17)

Extensive coverage is given to protective structures constructed along the Florida coast. Design criteria of groins are discussed including length, spacing, height, and permeability. Charts summarize types of shore protection structures as a function of specific beach conditions.

Key Words - Accretion/Erosion/S. Atlantic/Artificial-fill/System/
Permeable/Impermeable/Adjustable/Low/Misc-plan/Europe/
Timber/Rubble-mound/Structural-design/Asphalt/T-groins/
Scour/Piling/Z-groins/

"Stabilization of Shingle Alluvial Shores by Groins of Full Profile" 6400GR0001

Zhdanov, A. M., U. S. Army Coastal Engineering Research Center Bulletin, Vol. 1, 1964, pp. 32-40. (CERC Bull. Vol. 1)

A formula is presented for determining dimensions in the design of groins. Model tests are correlated with observations in the prototype. A design example is presented.

Key Words - Field/Model/Experimental/Structural-design/Theory/Asia/
Short/Impermeable/System/Low/

"Effects of Large Structures on the Ohio Shore of Lake Erie" 6400GR0002

Hartley, R. P., State of Ohio Department of Natural Resources, Division of Geological Survey, Report of Investigations No. 53, 1964, 30 pp. (QE151 .037r No. 53)

Large structures such as breakwaters and jetties which extend into Lake Erie are reviewed. Effects of the structures and their maintenance are given along with good aerial photographic coverage.

Key Words - Photographic/ERosion/Accretion/Maintenance/Great Lakes/

Oceanographical Engineering 6400GR0003

Wiegel, R. L., Prentice-Hall International Series in Theoretical and Applied Mechanics, Fluid Mechanics Series, Prentice-Hall Inc., Englewood Cliffs, N. J., 1964, 532 pp. (GC201 W5)

Part of Chapter 17 in this textbook discusses the use of groins; a good introduction to the subject.

Key Words - Permeable/Impermeable/High/Low/Adjustable/Z-groins/
Corner-groins/T-groins/Structural-design/Asphalt/
Artificial-fill/Misc-plan/Scouring/Theory/

"Proteccao da Costa Contra a Erosao
Maritima e Formacao de Praias de Arcia -
dois Problemas na Costa de Mocambique"
Gomes, N., Fomento, Vol. 2, No. 2, 1964,
pp. 73-88. 6400GR0004

Key Words - Not Annotated/

"Stability of Beaches Using Groins" 6406GR0001
Ishihara, T., and Sawaragi, T., Proceed-
ings of Ninth Conference on Coastal Eng-
ineering, ASCE, June, 1964, pp. 299-303.

The authors conducted a field investigation on the stability of beaches, using groins along the Imazu and Sakano Coasts in Tokushima, Japan. Based on the survey of coastal configuration between groins and on the estimation of the amount of littoral drift in the case of no structure, the storage capacity of permeable and impermeable groins was determined. It was found that the groins have to be designed in types, lengths and intervals so that equal amounts of littoral transport along the coast may be secured. Conclusions are presented.

Key Words - T-groins/Long/Permeable/Impermeable/Accretion/ERosion/
Asia/Field/Misc-plan/Short/Theory/

"Hunting Island Beach, South Carolina" 6407GR0001
U. S. Army Corps of Engineers, House Docu-
ment No. 323, 88th Congress, 2nd Session,
July, 1964.

Key Words - House Document/Not Annotated/

"Atlantic City, New Jersey Beach Erosion 6407GR0002
Control Study"
U. S. Army Corps of Engineers, House Docu-

ment No. 325, 88th Congress, 2nd Session,
July, 1964.

Key Words - House Document/Not Annotated/

"Falmouth, Massachusetts"
U. S. Army Corps of Engineers, House Docu-
ment No. 326, 88th Congress, 2nd Session,
July, 1964.

6407GR0003

Key Words - House Document/Not Annotated/

"A Pictorial History of Selected Structures
Along the New Jersey Coast"
Vesper, W. H., and Essick, M. G., U. S.
Army Coastal Engineering Research Center
Miscellaneous Paper, No. 5-64, Oct., 1964,
99 pp. (CERC M.P. 5-64)

6410GR0001

An extensive pictorial history of selected shore protection struc-
tures, this publication records relative effectiveness of the various
structures, including groins, from 1929 to 1961.

Key Words - N. Atlantic/Haupt/System/Timber/Accretion/ERosion/Imper-
meable/Low/Long/Short/Maintenance/Rubble-mound/Misc-plan/
Steel/Piling/High/Photographic/1900-1949/1960-1964/Single/
Concrete/

"Protection des Cotes Contre L'Erosion
Maritime et Formation des Plages de
Sable"

6410GR0002

Gomes, N., Hoville Blanche, Vol. 19,
No. 6, Oct., 1964, pp. 693-705.

Key Words - Not Annotated/

"Coastal Protection Procedures with
Reference to Conditions in Florida"
Bruun, P., Engineering Progress at the
University of Florida, Vol. 18, No. 12,
Bull. Series No. 118, Dec., 1964, Florida

6412GR0001

This article presents ordinances which govern shore protection measures for the city of Pompano, Florida. Included are codes for the maintenance and design of groins.

Key Words - Legal/Adjustable/S. Atlantic/Structural-design/Maintenance/

"Groins from Wisconsin on Lake Michigan" 6500GR0001
Essick, M. G., and Berg, D. W., U. S.
Army Coastal Engineering Research Center,
2 Vols., 1965, Unpublished Report.

Principally a historical review, report contains photographs, locations, and evaluations of permeable groins located on Lake Michigan in the state of Wisconsin.

Key Words - Permeable/Impermeable/System/Field/Great Lakes/Steel/
Piling/Structural-design/Concrete/Photographic/Long/Short/
High/Low/Maintenance/Timber/Erosion/Accretion/Rubble-mound/
1900-1949/1950-1954/1955-1959/1960-1964/1965-1969/

"Permeable Groins from Illinois on Lake Michigan" 6500GR0002
Essick, M. G., and Berg, D. W., U. S.
Army Coastal Engineering Research Center,
2 Vols., 1965, Unpublished Report.

A pictorial-historic review, this report includes locations, oblique aerial photographs, and conditions of permeable groins found along Lake Michigan in Illinois.

Key Words - Permeable/Great Lakes/Concrete/Structural-design/S. M.
Wood/Timber/Photographic/Maintenance/Erosion/Accretion/
System/Steel/Long/Short/Impermeable/Adjustable/Rubble-
mound/Field/Single/1900-1949/1950-1954/1955-1959/1960-
1964/1965-1969/

"Permeable and Semipermeable Groins from Ohio on Lake Erie" 6500GR0003
Essick, M. G., and Berg, D. W., U. S. Army

Coastal Engineering Research Center,
2 Vols., 1965, Unpublished Report.

Existing shore protection structures are listed as found on Lake Erie in the state of Ohio. U. S. House Documents give conditions of these structures that include permeable and semipermeable groins. Photographs, location of study sites, and evaluation of groin conditions are given.

Key Words - Field/Accretion/Erosion/Permeable/Timber/Concrete/Piling/
Steel/Great Lakes/Rubble-mound/Short/Long/Maintenance/
High/Low/S. M. Wood/1900-1949/1950-1954/1955-1959/1960-
1964/1965-1969/Structural-design/System/

"Report to the Twenty-First International
Navigation Congress"

6500GR0004

Shirdan, L., Twenty-First International
Navigation Congress, Permanent Interna-
tional Association of Navigation Congresses,
Brussels, Belgium, Section 2 - Ocean Navi-
gation, Subject 1, 1965, pp. 101-110.
(TCS .In8r)

Gabions used in the construction of a T-groin on the Mediterranean Sea are briefly discussed. The author concludes that it would be worthwhile to find adequate methods for the design and erection of future gabion-made groins.

Key Words - Misc-materials/T-groins/Asia/Geometric-shapes/Single/

"New Coastal Works at Nahariya (Israel)"
Fried, I. C. E., The Dock and Harbour
Authority, London, Vol. 45, Feb., 1965,
pp. 323-326. (TC203 .D637)

6502GR0001

A system of T-groins was constructed on the Israeli coastline of the Mediterranean Sea to improve bathing conditions. Design and economics of the project are given.

Key Words - T-groins/Erosion/Rubble-mound/Low/Structural-design/Asia/
Economics/Impermeable/System/Misc-plan/

"Westerly, Rhode Island"

6502GR0002

U. S. Army Corps of Engineers, House Document No. 85, 89th Congress, 1st Session, Feb., 1965.

Key Words - House Document/Not Annotated/

"Ocracoke Island, North Carolina"

6503GR0001

U. S. Army Corps of Engineers, House Document No. 109, 89th Congress, 1st Session, Mar., 1965.

Key Words - House Document/Not Annotated/

"Atlantic Coast of Long Island, Fire Island Inlet and Shore Westerly to Jones Inlet, New York"

6503GR0002

U. S. Army Corps of Engineers, House Document No. 115, 89th Congress, 1st Session, Mar., 1965.

Key Words - House Document/Not Annotated/

"Waikiki Beach, Oahu, Hawaii; Beach Erosion Control Study"

6503GR0003

U. S. Army Corps of Engineers, House Document No. 104, 89th Congress, 1st Session, Mar., 1965.

Key Words - House Document/Not Annotated/

"Haleiwa Beach, Oahu, Hawaii, Beach Erosion Control Study"

6503GR0004

U. S. Army Corps of Engineers, House Document No. 107, 89th Congress, 1st Session, Mar., 1965.

Key Words - House Document/Not Annotated/

"Emergency Methods to Combat Beach Erosion"

6504GR0001

Bruun, P., and Purpura, J. A.; The Dock and Harbour Authority, London, Vol. 45, No. 534, Apr., 1965, pp. 391-396.

Among emergency measures discussed, the repair procedures of groins damaged during storm action is given.

Key Words - Scour/Erosion/Maintenance/Artificial-fill/Adjustable/
Rubble-mound/Piling/

"Staten Island, Fort Wadsworth to Arthur Kill, New York, Beach Erosion Control Study" 6505GR0001

U. S. Army Corps of Engineers, House Document No. 181, 89th Congress, 1st Session, May, 1965.

Key Words - House Document/Not Annotated/

"Perth Amboy, New Jersey Beach Erosion Control Study" 6505GR0002

U. S. Army Corps of Engineers, House Document No. 186, 89th Congress, 1st Session, May, 1965.

Key Words - House Document/Not Annotated/

"City of Evanston, Illinois, Beach Erosion Control Study" 6505GR0003

U. S. Army Corps of Engineers, House Document No. 159, 89th Congress, 1st Session, May, 1965.

Key Words - House Document/Not Annotated/

"Atlantic Coast of New York City from East Rockaway Inlet to Rockaway Inlet and Jamaica Bay, New York" 6506GR0001

U. S. Army Corps of Engineers, House Document No. 215, 89th Congress, 1st Session, June, 1965.

Key Words - House Document/Not Annotated/

"Duval County, Florida"

6508GR0001

U. S. Army Corps of Engineers, House Document No. 273, 89th Congress, 1st Session, Aug., 1965.

Key Words - House Document/Not Annotated/

"Variations in Groin Design"

6510GR0001

Berg, D. W., and Watts, G. M., Coastal Engineering Santa Barbara Specialty Conference, ASCE, Oct., 1965, pp. 763-797. (TC203 .C9S6)

Considering all types of structures used for shore protection purposes, the groin is probably the most widely used and yet it is perhaps the one structure least understood. Groins or groin systems of a particular design may be found where the intended purpose was achieved; however, it is not uncommon to learn of other cases where a similar design was used and negligible benefits resulted. The purpose of this paper is to point out pertinent features of basic types of groins and to illustrate some of the many variations which have been built in the United States.

Key Words - Impermeable/Concrete/Steel/Geometric-shapes/Timber/Asphalt/Rubble-mound/Misc-materials/Permeable/S. M. Wood/Piling/S. Atlantic/N. Atlantic/California/Great Lakes/Alaska/T-groins/Hawaiian Islands/Texas Gulf/Adjustable/Z-groins/Structural-design/Budd/System/Low/Short/Single/High/Long/Erosion/Notched/Field/Photographic/

"Use of Long Groins as Artificial Headlands"

6510GR0002

Dunham, J. W., Coastal Engineering Santa Barbara Specialty Conference, ASCE, Oct., 1965, pp. 755-762. (TC203 .C9S6)

The construction of short groins to trap fillets of sand along coastal beaches characterized by prevailing littoral transport has become a well known practice in coastal engineering. Less common, but often equally important, is the use of long groins to form artificial headlands which trap sand more or less permanently in artificial pocket beaches. The successful use of this long-groin technique at

three Southern California beaches is described, the need for more research as to the effectiveness of such structures is suggested, and other possible uses of long groins are discussed.

Key Words - Long/California/Field/System/Short/Misc-plan/Before 1950/
1955-1959/1950-1954/1960-1964/Single/Impermeable/

"Groins and Effects - Minimizing Liabilities"
Lillivang, O. J., Coastal Engineering Santa
Barbara Specialty Conference, ASCE, Oct., 1965
pp. 749-754. (TC203 .C9S6)

6510GR0003

Groins produce various effects on different shorelines; design data are sparse, so experience and judgment become important design skills to a greater degree than in most engineering problems. Court decisions are described which, from the engineering standpoint, seem opposite in effect where physical conditions were similar. The conclusion is made that the engineer who undertakes projects including seacoast groins needs legal counsel, special engineering knowledge and experience, and a healthy respect for the continuing acceptability of the client's seacoast groins to neighboring proprietors.

Key Words - Legal/California/Erosion/

"Littoral Processes and the Development
of Shorelines"
Inman, D. L., and Frautschy, J. D., Coastal
Engineering Santa Barbara Specialty Confer-
ence, ASCE, Oct., 1965, pp. 511-536.
(TC203 .C9S6)

6510GR0004

Basic principles bearing on the nature of beaches and processes that act to modify them are considered in light of present coastal development demands. A working hypothesis is developed that applies the principle of the conservation of mass to the mechanics of granular-fluid media. This hypothesis appears to have general application to sand transport processes in the littoral zone. Additional research must be done to provide basic information in some critical areas before application can be made with assurance.

Key Words - S. Pacific/Misc-plan/System/Field/Theory/Impermeable/

"Study of Erosion Along Homer Spit and
Vicinity, Kachemak Bay, Alaska"

6511GR0001

Gronewald, G. J., and Duncan, W. W.,
Coastal Engineering Santa Barbara
Specialty Conference, ASCE, Oct., 1965,
pp. 573-682. (TC203 .C9S6)

This is a progress report on the Homer Spit Beach Erosion Study. Information is presented regarding the rapid acceleration of the erosion processes due to the subsidence of Homer Spit during the 27 March 1964 earthquake. The effect on existing groins both before and after the quake are discussed. Immediately after the quake, emergency measures were required to prevent wave and high water damage to existing structures on the spit. An evaluation of the effectiveness of these measures is presented along with basic data gathered from the study and some of the problems encountered.

Key Words - Alaska/Timber/System/Accretion/Adjustable/Misc-plan/
Permeable/Impermeable/1965-1969/

"Maritime and Riparian Use of Gabions"
Anonymous, The Dock and Harbour Authority,
London, Vol. 46, No. 542, Dec., 1965, p.
254.

6512GR0001

Describing the various uses of gabions, this article includes a discussion on their usefulness in groin construction. Providing a semi-permeable structure, the use of gabions is especially advantageous where scour may occur on the downdrift side of the groin.

Key Words - Scour/Misc-materials/Structural-design/Misc-plan/High/
Low/1965-1969/Permeable/Geometric-shapes/

"Sea Groins Effectiveness Investigations
Dyed Sand Tests"
Kolp, O., Beiträge zur Meereskunde,
Deutsche Akademie der Wissenschaften zu
Berlin Institute für Meereskunde, Berlin,
Issue 17-18, 1966, pp. 6-90. (Translation)

6600GR0001

Presented is a method for investigation of groin effectiveness which represents progress toward a solution of a controversial problem. Experimental methods in the use of dyed sand are described. The results are presented as examples of changes in submarine relief, changes in current fields, and distribution of dyed sands. The results indicate the correctness of this approach to an investigation of this type.

Key Words - System/Europe/Erosion/Field/Piling/Accretion/Impermeable/

"Coastal Processes"

6606GR0001

Johnson, J. W., and Eagleson, P. S.,
Estuary and Coastline Hydrodynamics,
A. T. Ippen, ed., McGraw-Hill Book Co.,
Inc., New York, June, 1966, pp. 266-268.
(GC20 .I64e)

A general introduction is presented concerning classification and types of groins and their purposes.

Key Words - Permeable/Impermeable/High/Low/Timber/Steel/Concrete/
Adjustable/System/Single/

"Shore Protection, Planning and Design"

6606GR0002

U. S. Army Corps of Engineers, Coastal
Engineering Research Center Technical
Report, No. 4, 3rd ed., June, 1966.

The purpose of groins, their effects, types of groins, design criteria of the different types, and construction considerations are presented in this comprehensive text. Plans and photographic illustrations are included.

Key Words - Accretion/Artificial-fill/Erosion/Scour/Const-procedure/
Structural-design/Geometric-shapes/High/Long/Low/Short/
Adjustable/Great Lakes/Misc-plan/Notches/Single/System/
California/Asphalt/Concrete/Piling/Rubble-mound/Steel/
Timber/Impermeable/Permeable/Case/Du-Plat-Taylor/

"Beach Erosion Control Study, St. Johns
County, Florida"

6607GR0001

U. S. Army Corps of Engineers, House Document No. 97, 89th Congress, 2nd Session, July, 1966.

Key Words - House Document/Not Annotated/

"Special Study of City of San Diego
(Sunset Cliffs), California"

6608GR0001

U. S. Army Corps of Engineers, House Document No. 477, 89th Congress, 2nd Session, Aug., 1966.

Key Words - House Document/Not Annotated/

"Scouring Due to Wave Action at the Toe of Permeable Coastal Structures"
Toru, S.; Proceedings of Tenth Conference on Coastal Engineering, ASCE, Vol. 2, Part 3, Sept., 1966, pp. 1036-1047.
(TC203 .C6)

6609GR0001

The author investigated scouring at the toe of permeable coastal structures on an experimental basis. He emphasized the influence on the scouring depth as affected by water depth at the toe, slope of seaward face and incident wave characteristics.

Key Words - Permeable/Experimental/Model/Scour/

"Shore Protection on the Coast of Yaizu"
Seo, G., and Fukuchi, T.; Proceedings of Tenth Conference on Coastal Engineering, ASCE, Vol. 2, Part 3, Sept., 1966, pp. 1183-1200. (TC203 .C6)

6609GR0002

A 15-element groin system was constructed as a measure of added protection against erosion at Yaizu, Japan. The paper deals mainly with the design of the breakwater structure, but photographs illustrate the groin system.

Key Words - Concrete/Impermeable/High/Short/System/Asia/

"Pinellas County, Florida"
U. S. Army Corps of Engineers, House Document No. 519, 89th Congress, 2nd Session, Oct., 1966.

6610GR0001

Key Words - House Document/Not Annotated/

"Mullet Key, Florida"
U. S. Army Corps of Engineers, House Document No. 516, 89th Congress, 2nd Session, Oct., 1966.

6610GR0002

Key Words - House Document/Not Annotated/

"Variations in Groin Design"

6705GR0001

Berg, D. W., and Watts, G. M., Journal of the Waterways and Harbors Division, ASCE, Vol. 93, No. WW2, Paper 5241, May, 1967, pp. 79-100.

See entry 6510GR0001.

Key Words - S. M. Wood/Adjustable/Budd/Permeable/Impermeable/System/
Low/Short/Concrete/Single/T-groins/Structural-design/
High/Long/Piling/Steel/Timber/Rubble-mound/Z-groins/
Misc-materials/Erosion/Notched/Asphalt/Field/Photographic/
N. Atlantic/Great Lakes/California/Hawaiian Islands/
S. Atlantic/Texas Gulf/Geometric-shapes/Alaska/

"Sea Defence Works - Groins and Revetments"
Manohar, M., Journal of the Institution of Engineers, London, Vol. 47, No. 9, Pt. C15,
May, 1967, pp. 782-792.

6705GR0002

Key Words - Not Annotated/

"Shore Protection Experience in the United States"
Anonymous, News Letter, American Shore and Beach Preservation Assoc., July, 1967, 4 pp.

6707GR0001

A cursory review of coastal protection in the U. S. including the Great Lakes is presented.

Key Words - N. Atlantic/S. Atlantic/Texas Gulf/California/Great Lakes/
1900-1949/1950-1954/1955-1959/1960-1964/1965-1969/Field/

"Effect of Particle Size and Distribution on Stability of Artificially Filled Beach, Presque Isle Peninsula, Pennsylvania"
Berg, D. W., and Duane, D. B., Proceedings of Eleventh Conference on Great Lakes Research, International Assoc. for Great Lakes Research, Apr., 1968, pp. 161-178.
(Available as CERC Reprint 1-69)

6805GR0001

Coarse fill material was placed between two groins in an area within that zone on Presque Isle Peninsula which had experienced the

greatest amount of erosion. Isometric block diagrams are given in this comprehensive report which show cumulative volume changes within the groin embayment during the period from 1956 to 1968.

Key Words - Artificial-fill/Great Lakes/Erosion/Accretion/System/
1955-1959/1960-1964/1965-1969/

"Dade County, Florida"

6806GR0001

U. S. Army Corps of Engineers, House Document No. 335, 90th Congress, 2nd Session, June, 1968.

Key Words - House Document/Not Annotated/

"Brevard County, Florida"

6807GR0001

U. S. Army Corps of Engineers, House Document No. 352, 90th Congress, 2nd Session, July, 1968.

Key Words - House Document/Not Annotated/

"The Dynamics of a Coast with a Groyne System"

6809GR0001

Bakker, W. T., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, Sept., 1968, pp. 492-517.
(TC203 .C6)

A mathematical theory is presented about phenomena which occur when groins are constructed. In this theory the coast is schematized by two lines; one represents the beach, and the other the inshore. Theory is based upon the following: (1) littoral transport is a linear dependent of the angle of wave incidence, and (2) sand transport perpendicular to the coast depends on the steepness of the profile.

It was found that the influence of a groin system is threefold: (1) it reflects short-period beach processes on the adjacent areas, (2) retards erosion, and (3) gives lee-side scour.

Key Words - System/Impermeable/Erosion/Theory/Accretion/Single/Transport-normal/

"The Effect of Groynes on Stable Beaches"
Price, W. A., and Tomlinson, K. W., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, 1968, pp. 518-525. (TC203 .C6)

6809GR0002

Tests were carried out in a wave basin to study the effect of groins on a beach that was stable for a particular wave climate and a given supply of littoral material. The main result showed that on the part of the beach between H.W. and L.W. level the groins produced no buildup. The only buildup that occurred took place seaward of the impermeable groins. Permeable groins had little effect either inshore or offshore.

Key Words - Permeable/Impermeable/Accretion/Erosion/Experimental/
Model/High/Europe/Mobbs/

"Experimental Study of the Hydraulic Behavior of Groyne Systems"
Barcelo, J. P., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, Sept., 1968, pp. 526-548. (TC203 .C6)

6809GR0003

Results of an experimental study of the hydraulic behavior of groin systems are described. Characteristics of the evolution of beach stretches between groins under action of waves with different obliquity, heights and periods are defined. Results obtained are intended for design of systems of functional groins which secure an adequate partition of the beach in satisfactory hydraulic conditions, and also meeting use requirements, notably from the architectural and recreation standpoints. The author briefly discusses longshore transport, and presents some experimental conclusions on the relations between longshore drift and the characteristics of the waves.

Key Words - Experimental/Model/Theory/Short/Erosion/Accretion/Long/
System/Impermeable/

"The Creation of an Artificial Beach in Larvotto Bay -- Monte Carlo Principality of Monaco"
Tourmen, L., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, Sept., 1968, pp. 558-569. (TC203 .C6)

6809GR0004

Two short groins with breakwaters at their tips in a T-groin fashion were constructed in Larvotto Bay, Monte Carlo. The desired effect - to maintain a widened beach - was attained.

Key Words - Europe/System/Accretion/Concrete/Short/Impermeable/
Misc-plan/1965-1969/T-groins/

"The Terminal Problem in Coast Protection"
Pallett, N., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, Sept., 1968, pp. 549-557. (TC203 .C6)

6809GR0005

This paper introduces the terminal erosion problem which usually occurs downdrift of coast protection works, an important aspect of coast protection often overlooked. Value of groins in stabilizing the foreshore; use of artificial beach replenishment; and the effect on longshore regime following the construction of a seawall are discussed and illustrated.

Key Words - Terminal/Europe/Accretion/1960-1964/System/Erosion/
Artificial-fill/

"Cliff Drainage and Beach Distribution"
Fryde, W. T., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 1, Sept., 1968, pp. 644-652. (TC203 .C6)

6809GR0006

The main supply of material to the Clacton beaches was cut off following the construction of a seawall at the toe of the cliffs along the entire frontage. Supply from littoral drift was small and the only method of preserving the beaches was a good system of groins and the occasional placement of artificial fill.

Key Words - Europe/Concrete/Timber/1900-1949/Impermeable/Erosion/
Misc-plan/Structural-design/Accretion/System/
Artificial-fill/

"The Atlantic Coast of Long Island"
Panuzio, F. L., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 2, Sept., 1968, pp. 1222-1241. (TC203 .C6)

6809GR0007

This paper presents history, problems, construction and current results concerning critical condition of shore erosion, unstable inlets, and coastal inundation along the Long Island coast. Groin construction and resultant effects are discussed.

Key Words - N. Atlantic/Accretion/Erosion/System/High/Artificial-fill/Rubble-mound/Impermeable/1965-1969/

"Dubai Creek Entrance"

6809GR0008

Ridehalgh, H., Proceedings of Eleventh Conference on Coastal Engineering, ASCE, Vol. 2, Sept., 1968, pp. 1258-1266. (TC203 .C6)

This paper describes works to improve and stabilize the Dubai Creek entrance located on the Arabian Gulf Coast. As part of the project a groin (jetty) was constructed to protect the entrance and to encourage accretion. Maps show accretion as the different phases of the project are completed.

Key Words - Asia/Steel/Piling/Accretion/Single/Impermeable/

"A Mathematical Theory about Sand Waves and Its Application on the Dutch Wadden Isle of Vlieland"

6810GR0001

Bakker, W. T., Shore and Beach, American Shore and Beach Preservation Assoc., Vol. 36, No. 2, Oct., 1968, pp. 5-14.

A mathematical theory for predicting sand wave formation was tested in the field, and showed that groins totally reflect the sand wave. The amplitude of the accretion and erosion at the spot of the first groin becomes twice the accretion and erosion where no groins had been constructed.

Key Words - Theory/Field/Impermeable/Erosion/Accretion/1966-1969/

"Report to the Twenty-second International Navigation Congress"

6900GR0001

Bijker, E. W., and Svasek, J. N., Twenty-second International Navigation Congress, Permanent International Association of Navigation Congresses, Sec. II, 1969, pp. 181-202. (TC5 .InBr)

This is an extensive research paper covering such aspects as theoretical and statistical analysis of longshore transport behavior of sediment movement, sediment balances, and determination of wave and current scale models. The influence of morphological mechanisms is outlined. Though groins are not explicitly discussed, structures are discussed which act similar to groins.

Key Words - Europe/Model/Experimental/Theory/

"Beach Erosion and Coastal Development
in the Canterbury Bight"
Kirk, R. M., New Zealand Geographer,
Christchurch, New Zealand, Vol. 25, 1969.

6900GR0002

Key Words - Not Annotated/

"Report to the Twenty-second International
Navigation Congress"
Féve, M., Twenty-second International
Navigation Congress, Permanent International
Association of Navigation Congresses,
Brussels, Belgium, Section 2 - Ocean Navigation,
Subject 4, 1969, pp. 63-109.
(TC5 .In8r)

6900GR0003

Key Words - Not Annotated/

"Report to the Twenty-second International
Navigation Congress"

6900GR0004

Abecasis, F., Castanho, J., Matias, M. F.,
Twenty-second International Navigation Congress
Permanent International Association of Navigation
Congresses, Brussels, Section 2 - Ocean Navigation,
Subject 4, 1969, pp. 203-242. (TC5 .IN8r)

A groin system was built along sand-spits to reinforce the spits and to check their end growth. Initially, artificial-fill was introduced into the system. The effects are presented in this paper.

Key Words - Africa/Europe/System/Artificial-fill/Erosion/
Accretion/1960-1964/1965-1969/Impermeable/

"Beach Erosion Control in New England"
Wentworth, C. E., Shore and Beach,
American Shore and Beach Preservation
Assoc., Vol. 37, No. 2, Oct., 1969,
pp. 24-30.

6910GR0001

An improvement plan consisting of groin construction and sand fill is outlined for Plum Island, Massachusetts.

Key Words - System/N. Atlantic/Artificial-fill/

"Colored-sand Tests with Luminescent Sand
Groin Fields"
Kolp, O., Petermanns Geographische Mitteilungen,
Vol. 114, 1970. Translated. (GB454 .B3 K29)

7000GR0001

The objectives of this investigation were: (1) the exploration of an approach that could be followed in later studies and which would be centered around the execution of colored-sand experiments; (2) to give a zonal breakdown of relief, flow field, sediment movement, and colored-sand distribution, and their modification by groins on various charts, and (3) to evaluate the effectiveness of various types of groins and to compare the hydrographic conditions existing in the shore areas of sections of coast with and without groins.

Key Words - 1960-1964/1965-1969/Erosion/Accretion/Europe/
Experimental/Scour/Piling/Impermeable/

"Coastal Defence Works"
Abecasis, F., Laboratório Nacional de
Engenharia Civil, Memoria No. 362, 1970,
pp. 36-40 (TC158 .P6 P853m)

7000GR0002

An extensive groin system built along a spit was designed not only to reinforce the spit, but also to stop its end growth. Initially, the inter-groin spaces were artificially filled.

Key Words - Africa/System/Impermeable/

"Model Studies in Situ Observations"
Castanho, J., Laboratorio Nacional de
Engenharia Civil, Memoria No. 362, 1970,
pp. 21-28. (TC158 .P6 P853m)

7000GR0003

Laboratory model studies followed extensive field investigations of coastal areas with erosion problems. After these studies were completed, effective measures, including groin construction, were applied.

Key Words - Europe/System/Model/Experimental/Impermeable/

"The History of the Dutch Coast in the Last Century"

7009GR0001

Bakker, W. T., and Joustra, D. Sj.,
Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Vol. 2, Sept., 1970, pp. 709-728. (TC203 .C6)

An investigation of the influence of groins concluded that the erosion of areas with groins was much less than erosion of adjacent areas. This effect is due partly to lee-side scour, but mainly to decreased erosion in the protected area.

Key Words - Scour/Europe/Field/Rubble-mound/1800-1900/1900-1949/
1950-1954/1955-1959/1960-1964/Erosion/Accretion/
System/Impermeable/

"Some Sand Transport Phenomena on Coasts with Bars"

7009GR0002

Dyhr-Nielsen, M., and Sorensen, T.,
Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Vol. 2, Sept., 1970, pp. 855-866. (TC203 .C6)

Effects of a single groin and a groin system located on the Danish west coast were investigated by field investigation and model tests.

Key Words - Europe/1900-1949/1950-1954/1955-1959/Single/System/
Impermeable/Model/Field/Experimental/Erosion/1965-1969/
Accretion/Structural-design/

"Experimental Study of the Hydraulic Behavior of Inclined Groyne Systems"

7009GR0003

Barcelo, J. P., Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Vol. 2, Sept., 1970, pp. 1021-1040. (TC203 .C6)

This paper presents the results of an experimental study on the behavior of inclined groins and a short discussion on the improvement of groin systems. It supplements a paper presented at the Eleventh Coastal Engineering Conference (London, 1968). In the present paper both studies are applied to the design of a groin system located to the south of the Tagus estuary (near Lisbon), where serious erosion has taken place.

Key Words - Transport-normal/System/Misc-plan/Accretion/Erosion/
T-groins/Europe/Experimental/1900-1949/1955-1959/1960-
1964/1965-1969/Impermeable/

"Land Reclamation and Groin-Building in
the Tidal Flats"

7009GR0004

Erchinger, H. F., Proceedings of the Twelfth
Coastal Engineering Conference, ASCE, Vol. 2,
Sept., 1970, pp. 1041-1052. (TC203 .C6)

Development of new groin designs and groin construction on tidal flats on the North Sea coast of Germany are described. Of interest is the use of polyethylene in groin construction.

Key Words - Europe/Misc-materials/Timber/Concrete/Impermeable/
Structural-design/Rubble-mound/

"The Effect of Groynes on Eroded Beaches"

7009GR0005

Price, W. A., and Tomlinson, K. W.,
Proceedings of the Twelfth Coastal
Engineering Conference, ASCE, Vol. 2,
Sept., 1970, pp. 1053-1059. (TC203 .C6)

Effect of impermeable groins on an eroded beach was studied in a laboratory. A beach was allowed to reach equilibrium for a particular wave climate and supply of littoral material. The foreshore was then manually eroded, and the beach allowed to return to equilibrium with and without groins. It was found that the presence of groins increased the rate of accretion but did not significantly build up the inshore beach beyond the stable levels. Bed levels seaward of the groins were increased.

Key Words - Impermeable/Accretion/Erosion/Experimental/System/Europe/

"Characteristics of Shingle Beaches: the Solution to some Practical Problems"
Wood, A. M. M.; Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Vol. 2, Sept., 1970, pp. 1059-1075. (TC203 .C6)

7009GR0006

Shingle beaches differ from sand beaches mainly in the mode of transport of the material and in the permeability of the beach. The typical beach forms are in consequence different and the typical problems of beach stabilization require different solutions.

The mechanism of littoral transport of shingle is controlled predominantly by the action of the breaking wave; on a groined beach a simple theory is advanced to relate transport to groin length and spacing.

Key Words - System/High/Theory/Field/Misc-plan/Long/Piling/
Steel/Concrete/Timber/Europe/

"Variation of Topography of Sea-Bed Caused by the Construction of Breakwaters"
Sato, S., and Irie, I., Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Sept., 1970, pp. 1301-1319. (TC203 .C6)

7009GR0007

Changes of the topography of sea-bed caused by the construction of jetties and breakwaters are discussed on the basis of charts of several Japanese ports and the results of model tests.

Key Words - Asia/Field/Model/Experimental/

"The Dynamics of a Coast with a Groyne System"
Bakker, W. T., Breteler, E. H. J. K., Roos, A., Proceedings of the Twelfth Coastal Engineering Conference, ASCE, Vol. 2, Sept., 1970, pp. 1001-1020. (TC203 .C6)

7009GR0008

Mathematical coastal model is schematized by a beach line and an inshore line (two-line theory). Two aspects of the effects of a groin system are covered: (1) Prevention of littoral transport in area between shoreline and groin head, and (2) formation of a sheltered area at lee-side of groin, caused by diffraction.

Key Words - Theory/System/Model/Accretion/Erosion/Impermeable/

"Beach Behavior, North Shore, Long Island Sound"

7011GR0001

McCabe, R. A., Journal of Waterways, Harbors and Coastal Engineering Division, ASCE, Vol. 96, No. WW4, Paper No. 7679, Nov., 1970, pp. 781-794.

A groin system constructed and evaluated on White Sand Beach has shown: (1) necessary depth of the updrift flank of a groin depends on minimum sand cover on that side of the groin, and can be independent of the downdrift depth; (2) maximum width of the resulting stable beach is limited by capacity of a shorter groin at the end and the amount of sand available; (3) groin construction does not cause recession of an adjacent beach if that beach was already in its natural orientation, and (4) a groin is filled to capacity when it spills sand between the beach toe and the limit of normal wave uprush - in this study above about 2 feet higher than M.H.W.

Key Words - N. Atlantic/Rubble-mound/Structural-design/Misc-plan/
System/

"Experiment in Shore Protection"

7105GR0001

Riese, R. C., The Military Engineer, Society of American Military Engineers, Vol. 63, No. 413, May-June, 1971, pp. 181-182.

Lt. Colonel Riese from the Los Angeles District, U. S. Army Corps of Engineers, has outlined the Coastal Engineering Research Center's experimental groin project at Point Mugu, California. The project is designed to determine the influence, under different conditions of height, length, and permeability, the quantitative movement of sand over, around, and through a groin.

Key Words - Concrete/Long/High/Impermeable/Permeable/Adjustable/
Short/Low/Experimental/Field/Single/1970-1974/
California/

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NA - APPENDIX VI HUMBOLDT BAY (BUHNE POINT) CALIFORNIA BEACH EROSION CONTROL STUDY
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| NA - SANTA CRUZ COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY | 5705GR0004 |
| NA - BELLE PASS TO RACCOON POINT LOUISIANA BEACH EROSION CONTROL STUDY | 6202GR0001 |
| NA - AREAS 8 AND 11 SAUGATUCK RIVER TO BYRAM RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5705GR0003 |
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| NA - VIRGINIA BEACH VIRGINIA COOPERATIVE BEACH EROSION CONTROL STUDY | 6204GR0005 |
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| NA - PALM BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE WORTH INLET AND FROM SOUTH LAKE WORTH INLET TO BR OWARD COUNTY LINE BEACH EROSION CONTROL STUDY | 6105GR0002 |
| NA - SOUTH KINGSTON AND WESTERLY RHODE ISLAND BEACH EROSION CONTROL STUDY | 5809GR0001 |
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| NA - SHORE BETWEEN PEMBERTON POINT AND CAPE COD MASSACHUSETTS BEACH EROSION CONTROL STUDY | 5910GR0001 |
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| NA - THAMES RIVER TO NANTIC "BAT CONNECTICUT BEACH EROSION CONTROL STUDY | 5801GR0001 |
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 NA - BEACH EROSION CONTROL STUDY ST. JOHNS COUNTY FLORIDA
 NA - STATION ISLAND FORT MADSWORTH TO ARTHUR KILL NEW YORK BEACH EROSION CONTROL STUDY
 NA - ATLANTIC COAST OF LONG ISLAND FIRE ISLAND INLET AND SHORE WESTERLY TO JONES INLET NEW YORK
 NA - MAIKIKI BEACH OAHU HAWAII BEACH EROSION CONTROL STUDY
 NA - HALEIWA BEACH OAHU HAWAII BEACH EROSION CONTROL STUDY
 NA - SPECIAL STUDY OF CITY OF SAN DIEGO (SUNSET CLIFFS) CALIFORNIA
 NA - DUVAL COUNTY FLORIDA
 NA - BREVARD COUNTY FLORIDA
 NA - REPORT TO THE 22ND INTERNATIONAL NAVIGATION CONGRESS
 NA - ATLANTIC COAST OF NEW YORK CITY FROM EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA BAY NEW YORK
 NA - BEACH EROSION AND COASTAL DEVELOPMENT IN THE CANTERBURY BIGHT
 NA - CITY OF EVANSTON ILLINOIS BEACH EROSION CONTROL STUDY
 NA - PINELLAS COUNTY FLORIDA
 NA - PERTH AWOBY NEW JERSEY BEACH EROSION CONTROL STUDY
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 NA - CAROLINA BEACH AND VICINITY NORTH CAROLINA
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 MOCAMBIQUE
 NA - CLARK POINT NEW BEDFORD MASSACHUSETTS BEACH EROSION CONTROL STUDY
 NA - SHORE BETWEEN PEMBERTON POINT AND CAPE COD MASSACHUSETTS BEACH EROSION CONTROL STUDY
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 NA - SHORE OF NEW JERSEY - BARNEGAT INLET TO CAPE MAY CANAL BEACH EROSION CONTROL STUDY
 NA - A SCIENTIFIC BASIS FOR DESIGN OF GROUNE SYSTEMS
 NA - UBER DEN EINFLUSS VON STRANDRUHREN AUF DIE STRANDWANDERUNG AN FLACHKUSTEN
 NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL INTERIM REPORT ON THE VENTURA AREA COOPERATIVE BEACH EROSION
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 NA - RARITAN BAY AND SANDY HOOK BAY NEW JERSEY
 NA - SAN GABRIEL RIVER TO NEWPORT BAY ORANGE COUNTY CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY
 NA - NEW JERSEY COAST OF DELAWARE BAY FROM CAPE MAY CANAL TO MAURICE RIVER BEACH EROSION CONTROL STUDY
 NA - AMELIA ISLAND FLORIDA BEACH EROSION CONTROL STUDY
 NA - COAST PROTECTION - GROYNES
 NA - WASSAGUSSETT BEACH WETMOUTH MASSACHUSETTS
 NA - SAN DIEGO COUNTY CALIFORNIA APPENDIX IV PHASE 2 BEACH EROSION CONTROL STUDY
 NA - AN INVESTIGATION INTO THE EFFECTIVENESS OF VARIOUS TYPES OF GROYNES ON SEAFORD BEACH
 NA - GROINS WITH ASPHALT GROUT IN EAST FRIESIAN COAST REGION

- NA - MODEL INVESTIGATIONS OF HARBOR INLET SILTING
- NA - BELLE PASS TO RACCOON POINT LOUISIANA BEACH EROSION CONTROL STUDY
- NA - VIRGINIA BEACH VIRGINIA COUPEATIVE BEACH EROSION CONTROL STUDY
- NA - SEA DEFENCE GROUNES
- NA - GROUNES AS BARRIERS TO MOVEMENT OF BEACH MATERIAL
- NA - HUNTING ISLAND BEACH SOUTH CAROLINA
- NA - BEACH EROSION CONTROL REPORT ON COUPEATIVE STUDY OF VIRGINIA AND HISCAYNE KEYS FLORIDA
- NA - CULTIVATED LAND CONSERVATION AND RECLAMATION
- NA - PROTECTION OF THE WEST BEACH OF SYLT ISLAND BY FLAT GROINS
- NA - PALM BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE WORTH INLET AND FROM SOUTH LAKE WORTH INLET TO BK OAKLAND COUNTY LINE BEACH EROSION CONTROL STUDY
- NA - APPENDIX XI OHIO SHORE LINE OF LAKE ERIE EUCLID TO CHAGRIN RIVER BEACH EROSION CONTROL STUDY
- NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF FLOATING ISLANDS OF THE SOUTH COAST OF GERMAN NORTH SEA
- NA - DIE NORDOSTLICHE HEIDE HECKLENBURG
- NA - APPENDIXES V AND X OHIO SHORE LINE OF LAKE ERIE BETWEEN ASHTABULA AND THE PENNSYLVANIA STATE LINE BEACH EROSION CONTROL STUDY
- NA - APPENDICES III VII AND XII OHIO SHORE LINE OF LAKE ERIE BETWEEN FAIRPORT AND ASHTABULA BEACH EROSION CONTROL STUDY
- NA - COLD SPRING INLET (CAPE MAY HARBOR) NEW JERSEY
- NA - AREAS H AND LI SAUGATUCK RIVER TO HYAM RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
- NA - CHATHAM MASSACHUSETTS BEACH EROSION CONTROL STUDY
- NA - SANTA CRUZ COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY
- NA - CONSTRUCTION OF A HEAVY DUNE COVER BY ASPHALT-HASALT METHOD ON THE ISLAND OF BORKUM
- NA - DELAWARE COAST FROM KITTS HUMMOCK TO FENWICK ISLAND BEACH EROSION CONTROL STUDY
- NA - GENERAL COASTAL DYNAMICS AND TEXAS BEACH PROTECTION OF THE SOUTH BALTIC SEA BETWEEN TRAVE AND SWINE
- NA - GULF SHORE OF GALVESTON ISLAND TEXAS BEACH EROSION CONTROL STUDY
- NA - WAIKIKI BEACH ISLAND OF OAHU T. H. BEACH EROSION CONTROL STUDY
- NA - AREA 6 - NIANTIC BAY TO CONNECTICUT RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
- NA - BRANDUNGSUNTERSUCHUNGEN AN DEN KUSTEN VON FERHARN UND NORDWAGRIEN
- NA - MODEL TESTS OF WAVE RUN-UP ON SEA DYKES IN WATT REGION
- NA - EFFECTS OF COASTAL PROTECTIVE STRUCTURES ON SYLT
- NA - MAIMEA BEACH AND MANAPEPE BAY ISLAND OF KAUAI T. H. BEACH EROSION CONTROL STUDY
- NA - ON THE FLOW CHARACTERISTICS IN THE VICINITY OF GROINS
- NA - ON THE EFFECTS OF GROINS
- NA - RACINE COUNTY WISCONSIN BEACH EROSION CONTROL STUDY
- NA - APPENDIX VI HUMBOLDT BAY (RUHNE POINT) CALIFORNIA BEACH EROSION CONTROL STUDY
- NA - ON THE ALIGNMENT OF COASTAL GROINS
- NA - APPENDIX I COAST OF CALIFORNIA CARPENTERIA TO POINT HUGO BEACH EROSION CONTROL STUDY
- NA - PRESQUE ISLE PENINSULA ERIE PENNSYLVANIA BEACH EROSION CONTROL STUDY
- NA - SURGE AND SHORE CHANGES ON THE WEST COAST OF SYLT
- NA - HAMPTON BEACH NEW HAMPSHIRE BEACH EROSION CONTROL STUDY
- NA - FAIR HAVEN BEACH STATE PARK NEW YORK BEACH EROSION CONTROL STUDY
- NA - GUTACHTLICHE STELLUNGNAME ZU DEN UNTERSUCHUNGEN UBER DIE URSACHEN DER ABRUCHERSCHNEINUNGEN AM WEST UND NORD WESTSTRAND DER INSEL NORDERNEY
- NA - DIE URSACHEN DER ABRUCHERSCHNEINUNGEN AN WEST UND NORDWESTSTRAND DER INSEL NORDERNEY
- NA - HELGOLAND HISTORY OF ITS ORIGIN AND MAINTENANCE OF ITS HARBOR RELATIVE TO NAVIGATION
- NA - THE EFFECT OF ISLAND PROTECTIVE STRUCTURES ON BEACH DEVELOPMENT IN WEST PART OF NORDERNEY
- NA - ORIGIN AND DEVELOPMENT OF ISLAND PROTECTIVE WORKS ON NORDERNEY
- NA - UFERVERANDERUNGEN UND KUSTENSCHUTZ AUF SYLT
- NA - WHAT WATER ECONOMY EXPECTS FROM COASTAL RESEARCH
- NA - ANAHEIM BAY HARBOR CALIFORNIA
- NA - BEACH ABRASION BY WAVES - REFLECTION ON STEEP WALL TYPE OF COASTAL PROTECTIVE STRUCTURES
- NA - AREA 3 - NEW HAVEN HARBOR TO HOUSATONIC RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
- NA - ASPHALT CONSTRUCTION IN GROIN BUILDING
- NA - ABRUCH UND SCHUTZ DER STELLER AN DER OSTSEEKUSTE
- NA - GRAND ISLE LOUISIANA BEACH EROSION CONTROL STUDY

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| NA - APPENDIX VIII OHIO SHORE LINE OF LAKE ERIE BETWEEN VERMILLION AND SHEFFIELD LAKE VILLAGE BEACH EROSION CONTROL STUDY | | 53086GR0003 |
| NA - DIE WÄTERUNG DER BÜHNE H IN WANGERGEGE WEST AUF DIE SEEAGT | | 52006GR0004 |
| NA - THEORETICAL OBSERVATIONS FOR INSTALLATION OF COASTAL PROTECTIVE STRUCTURES ON TIDELESS SHORES | | 53006GR0002 |
| NA - AREA 7 - HOUSATONIC RIVER TO ASH CREEK CONNECTICUT BEACH EROSION CONTROL STUDY | | 53106GR0007 |
| NA - FOLGERUNGEN AUS UNTERSUCHUNGEN ÜBER KÜSTENSCHUTZPROBLEME AUF SYLT | | 57006GR0007 |
| NA - HAMLIN BEACH STATE PARK NEW YORK BEACH EROSION CONTROL STUDY | | 55046GR0006 |
| NA - HYDRAULIC STRUCTURES (GROINS DAMS DYKES AND CANAL EMBANKMENTS) OF BITUMEN TYPE | | 53006GR0004 |
| NA - PALM BEACH COUNTY FROM LAKE WORTH INLET TO SOUTH LAKE WORTH INLET FLORIDA BEACH EROSION CONTROL STUDY | | 57126GR0004 |
| NA - BIOLOGICAL HELP IN COASTAL PROTECTION | | 58006GR0001 |
| NA - SCHUTZ UND ENTWASSERUNG DER NIEDERUNGSGEBIETE AN DER SCHLESWIG-HOLSTEINISCHEN OSTSEEKÜSTE | | 58006GR0002 |
| NA - DUNE PROTECTIVE WORKS ON SYLT | | 58006GR0003 |
| NA - ILLINOIS SHORE OF LAKE MICHIGAN BEACH EROSION CONTROL STUDY | | 52106GR0006 |
| NA - STEEP SHORE OF BROUTEN - CAUSE OF BREAKING *** | | 53006GR0005 |
| NA - KÜSTENFORSCHUNGEN IM RAUM FERNHORN NORDWAGRIEN | | 57006GR0009 |
| NA - ALLGEMEINE EMPFEHLUNGEN FÜR DEN DEUTSCHEN KÜSTENSCHUTZ | | 55006GR0002 |
| NA - PLUM ISLAND MASSACHUSETTS BEACH EROSION CONTROL STUDY | | 53086GR0002 |
| NA - DIE ABGRUNDUNGSACHSEN AN DER NORDWESTKÜSTE DES ELLENBOGENS AUF SYLT | | 57006GR0008 |
| NA - VIRGINIA BEACH VIRGINIA BEACH EROSION CONTROL STUDY | | 53066GR0004 |
| NA - AREA 4 - CONNECTICUT RIVER TO HAMMONSETT RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | 52066GR0001 |
| NA - HUNDERT JAHRE KÜSTENSCHUTZ AN DER NORDBSEE | | 55006GR0003 |
| NA - PINELLAS COUNTY FLORIDA BEACH EROSION CONTROL STUDY | | 54046GR0001 |
| NA - MATERIALVORBEREITUNG PA HARKYSTER | | 53066GR0005 |
| NA - FLOOD PROTECTION AND COAST STABILIZATION | | 56006GR0005 |
| NA - WATER ECONOMY BETWEEN NORTH SEA AND BALTIC SEA 1948-58 | | 58006GR0006 |
| NA - SWELL AND SURGE AS BASIS FOR PLANNING AND DESIGN IN SEA STRUCTURES AND COASTAL PROTECTION | | 58006GR0007 |
| NA - ARTIFICIAL RESTORATION OF BEACHES WITH SPECIAL REGARD FOR BEACH FLUSHING NOKDERNEY 1951-52 | | 57006GR0014 |
| NA - THAMES RIVER TO NIANTIC BAY CONNECTICUT BEACH EROSION CONTROL STUDY | | 58016GR0001 |
| NA - OCEAN CITY NEW JERSEY BEACH EROSION CONTROL STUDY | | 53066GR0003 |
| NA - BERRIEN COUNTY MICHIGAN BEACH EROSION CONTROL STUDY | | 58026GR0001 |
| NA - POSSIBILITIES AND LIMITS FOR APPLICATION OF ASPHALT TYPES OF CONSTRUCTIONS FOR COASTAL PROTECTION | | 57006GR0013 |
| NA - SHORE OF NEW JERSEY FROM SANDY HOOK TO BARNEGAT INLET BEACH EROSION CONTROL STUDY | | 58026GR0002 |
| NA - ISLAND PROTECTION ON EAST FAIRFAX COAST | | 56006GR0003 |
| NA - APPENDIX II COAST OF CALIFORNIA POINT MUGO TO SAN PEDRO BREAKWATER BEACH EROSION CONTROL STUDY | | 53116GR0002 |
| NA - OCEAN SIDE OCEAN BEACH IMPERIAL BEACH AND CONDONADO SAN DIEGO COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY | | 56056GR0001 |
| NA - COASTAL PROTECTION AND SCIENTIFIC BASIS OF RESEARCH | | 57006GR0012 |
| NA - WHAT HAPPENED TO PROTECTION OF OUR BALTIC SEA COAST | | 56006GR0002 |
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| NA - CITY OF KENOSHAWISCONSIN BEACH EROSION CONTROL STUDY | | 56056GR0002 |
| NA - FIRE ISLAND INLET TO JONES INLET LONG ISLAND NEW YORK COOPERATIVE BEACH EROSION CONTROL STUDY | | 56056GR0003 |
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5604GR0001
4900GR0004
4700GR0001
4806GR0001
4900GR0001
5010GR0001
5204GR0001
5008GR0001
4410GR0002
4410GR0001
4900GR0005
4904GR0001
4510GR0001
5200GR0002
4602GR0001
4900GR0003
5306GR0001
5000GR0003
5210GR0008
3512GR0001
4101GR0001
3812GR0001
3804GR0001
4010GR0001
3807GR0005
3811GR0001
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| THE WUSENITZ PRECAST PERMEABLE GROIN | | |
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| VARIATIONS IN GROIN DESIGN | | |

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3801GR0002
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4001GR0003
3607GR0002
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4410GR0002
2712GR0001
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3106GR0001
3806GR0001
3202GR0001
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3807GR0004
3604GR0002
3012GR0001
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| | THE CREATION OF AN ARTIFICIAL BEACH IN LARVOTTO BAY MONTE CARLO PRINCIPALITY OF MONACO | 6900GR0004 |
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| | THE ROSENITZ PRECAST PERMEABLE GROIN | |
| 1970-1974 | | 7105GR0001 |
| | EXPERIMENT IN SHORE PROTECTION | |

KEY WORDS AND CATEGORIES

Beach Dynamics under Groin Influence

| | | |
|-----------------|---------|------------------|
| Accretion | Erosion | Shoaling |
| Artificial-fill | Scour | Transport-normal |

Construction Data

| | | |
|-----------------|-------------|-------------------|
| Const-problems | Economics | Structural-design |
| Const-procedure | Maintenance | |

Construction and Survey Dates

| | | |
|-----------|-----------|-----------|
| 1800-1900 | 1955-1959 | 1965-1969 |
| 1900-1949 | 1960-1964 | 1970-1974 |
| 1950-1954 | | |

Dimensions

| | | |
|------------------|------|-------|
| Geometric-shapes | Long | Short |
| High | Low | |

Groin Types and Design

| | | |
|---------------|---------|----------|
| Adjustable | Notched | Terminal |
| Corner-groins | Single | T-groins |
| L-groins | Spur | Z-groins |
| Misc-plan | System | |

Location

| | | |
|------------|------------------|-------------|
| Africa | Central America | N. Atlantic |
| Alaska | Europe | N. Pacific |
| Asia | Great Lakes | S. Atlantic |
| Australia | Hawaiian Islands | Texas Gulf |
| California | | |

Materials

| | | |
|----------------|--------------|--------|
| Asphalt | Piling | Steel |
| Concrete | Rubble-mound | Timber |
| Misc-materials | | |

Miscellaneous

House Document
Legal

Not Annotated
Patent

Permeability

Impermeable

Permeable

Trade Names

Budd
Case
Du-Plat-Taylor

Haupt
Milliken
Mobbs

S. M. Wood
Wosenitz

Type of Investigation

Experimental
Field

Model
Photographic

Theory

DEFINITIONS OF KEY WORDS

Accretion: Artificial aggradation where a buildup of the beach occurs by an act of man; in this case by groin construction.

Adjustable: Groins in which height and permeability may be altered.

Africa: Refers to the shoreline of Africa.

Alaska: Refers to the shoreline of Alaska.

Artificial-fill: The process of replenishing a beach by artificial means.

Asia: Refers to any shoreline of the Asian Continent, Japan, Indian Subcontinent, and the eastern shore of the Mediterranean Sea.

Asphalt: Denotes that the groins are built in part or wholly of asphalt.

Australia: Refers to the shoreline of Australia.

Budd: Groin of Budd design.

California: Refers to the shoreline of California.

Case: Groin of Case design.

Central America: Refers to the shores of Central America.

Concrete: Denotes that the groins are built in part or wholly of concrete.

Const-problems: Any problems encountered during groin construction or as a result of faulty construction.

Const-procedure: Construction process and method.

Corner-groins: A type of groin which is built on the line that bisects the angle between the beach and a groin.

Du-Plat-Taylor: Groins of Du-Plat-Taylor design.

Economics: Actual, appropriated, or projected costs of groin construction and maintenance.

Erosion: Refers to shore erosion prior to or as a result of groin construction.

Europe: Refers to the shoreline of all European countries bordering the Atlantic Ocean, North Sea, Baltic Sea, and northern shore of the Mediterranean Sea.

Experimental: Reports which discuss experimental studies on groins either in the field or laboratory.

Field: Actual in-the-field studies as opposed to laboratory studies.

Geometric-shapes: Any material used to construct a groin or a component section of a groin that has geometric regularity, e.g. cellular groin, tetrapods.

Great Lakes: Refers to the shoreline of the Great Lakes.

Haupt: Groin of Haupt design.

Hawaiian Islands: Refers to the shores of the Hawaiian Islands.

High: Groins which are of sufficient height as to impede the passage of littoral drift and overtopping of waves at high tide.

House Document: Refers to U. S. Congress House of Representatives' Reports which contain pertinent data on groins.

Impermeable: Groins which prevent littoral drift from passing through the structure.

Legal: Any legal aspects concerning the construction of groins.

Long: A groin whose length extends beyond the breaker zone.

Low: Groins which do not exceed high tide level, and which allow passage of appreciable quantities of littoral drift by overtopping waves.

L-groins: Groins built in the shape of an "L".

Maintenance: Repair or additional construction of groins.

Milliken: Groin of Milliken design.

Misc-materials: Materials that groins may be constructed of other than the materials listed in the Key Word List.

Misc-plan: A plan view or description of the plan view of the alignment of a single groin or of a groin system with the beach, and the spacing of groins in a system.

Mobbs: Groin of Mobbs design.

Model: Pertains to laboratory investigations of groins by model studies.

Not Annotated: Articles which have not been annotated.

Notched: Groin with the entire length notched at the top providing increased permeability.

N. Atlantic: Refers to the shoreline of the United States from Maine to the Virginia-North Carolina state line.

N. Pacific: The shoreline of northwestern North America from Alaska south to the Oregon-California state line.

Patent: Articles which present groin patents.

Permeable: Groins which (have openings through the structure of sufficient size to) permit passage of appreciable quantities of littoral drift.

Photographic: Articles which present extensive photographic coverage of groins.

Piling: Denotes that the groin is built in part by piles.

Rubble-mound: Groins constructed in part or wholly of stone.

Scour: Removal of underwater material by waves and currents at the base or toe of a groin.

Shoaling: Deposition of underwater material in the vicinity of a groin as a result of decrease in the efficiency of wave and current capacity as caused by groins.

Short: A groin whose length does not extend beyond the breaker zone.

Single: Refers to a single groin.

Spur: A groin-type structure connected to the flank of a groin and normal to it.

Steel: Refers to groins constructed in part or totally of steel.

Structural-design: Design of a groin or system of groins.

System: A series of groins acting together to protect a long section of shoreline.

S. Atlantic: Refers to the shoreline of the United States from the Virginia-North Carolina state line to the tip of the Florida peninsula.

S. M. Wood: Groin of Sydney M. Wood design.

Terminal: The last groin on the updrift end of a groin system.

Texas Gulf: Refers to the shoreline of the Gulf of Mexico from the tip of the Florida peninsula to the Yucatan Peninsula.

Theory: Refers to articles presenting groin designs based upon mathematical formulae, model studies, and personal experience.

Timber: Groins constructed in part or wholly of wood products.

Transport-normal: Movement of beach and near shore material in a vector direction approximately normal to the shoreline.

T-groins: Groins built in the shape of a "T", ie. a groin with a breakwater at its seaward end.

Wosenitz: Groin of Wosenitz design.

Z-groins: A type of groin with one or more marked angular directional changes along its length as seen in plan view.

1800-1900

1900-1949

1950-1954

1955-1959 Inclusive dates denoting construction and survey dates
1960-1964 of groin projects.

1965-1969

1970-1974

K E Y W O R D I N D E X

ABRUCH NA - (ABBRUCH) UND SCHUTZ DER STEILFLUR AN DER OSTSEEKÜSTE 5200GR0003
 ABRUCHSERSCHNITT NA - GUTÄCHTLICHE STELLUNGNAHME ZU DEN UNTERSUCHUNGEN ÜBER DIE URSACHEN DER (ABBRUCHSERSCHNITTEN) AM WEST UND 5200GR0006
 NA - DIE URSACHEN DER (ABBRUCHSERSCHNITTEN) AN WEST UND NORDWESTSTRAND DER INSEL NORDERNEY 5200GR0005
 ABRUCHSACHSEN NA - DIE (ABBRUCHSACHSEN) AN DER NORDWESTKÜSTE DES ELLENBOGENS AUF SYLT 5700GR0008
 ABRASION NA - BEACH (ABRASION) BY WAVES - REFLECTION ON STEEP WALL TYPE OF COASTAL PROTECTIVE STRUCTURES 5500GR0005
 ACCRETION NA - CAUSES OF COAST EROSION AND (ACCRETION) 2600GR0001
 ADJUSTABLE DU-PLAT-TAYLOR (ADJUSTABLE) SCREW PILE GROYNES 3306GR0001
 ADVANTAGEOUS TEST WITH SCALE MODELS TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE (ADVANTAGEOUS) INSTALLATION OF GROINS 2806GR0001
 ADVISORY-BOARD REPORT OF (ADVISORY-BOARD) ON BEACH PROTECTION LOS-ANGELES COUNTY 3012GR0001
 AERIAL (AERIAL) PHOTOGRAPHS OF WALLIS-SAND STATE-BEACH RYE NEW-HAMPSHIRE 6306GR0001
 (AERIAL) PHOTOGRAPHS PLUM ISLAND MASSACHUSETTS 6206GR0001
 AGENCIES PARTICIPATION OF FEDERAL RELIEF (AGENCIES) IN BEACH PROTECTION PROJECTS 3607GR0001
 ALASKA STUDY OF EROSION ALONG HOMER SPIT AND VICINITY KACHEMAK-BAY (ALASKA) 6511GR0001
 ALIGNMENT NA - ON THE (ALIGNMENT) OF COASTAL GROINS 5511GR0005
 ALLGEMEINE NA - (ALLGEMEINE) EMPFEHLUNGEN FÜR DEN DEUTSCHEN KÜSTENSCHUTZ 5500GR0002
 ALLUVIAL STABILIZATION OF SHINGLE (ALLUVIAL) SHORES BY GROINS OF FULL PROFILE 6400GR0001
 AMELIA NA - (AMELIA) ISLAND FLORIDA BEACH EROSION CONTROL STUDY 6106GR0002
 ANAHEIM-BAY NA - (ANAHEIM-BAY) HARBOR CALIFORNIA 5403GR0001
 ANNA-MARIA NA - (ANNA-MARIA) AND LONGBOAT KEYS FLORIDA BEACH EROSION STUDY 4812GR0004
 ARCIA NA - PROTECCAO DA COSTA CONTRA A EROSAO MARITIMA E FORMACAO DE PRAIAS DE (ARCIA) - DOIS PROBLEMAS NA COSTA DE MOCAMBIQUE 6400GR0004
 ARRANGEMENT (ARRANGEMENT) OF GROINS ON A SANDY BEACH 5609GR0001
 ARTHUR-KILL NA - STATION ISLAND FORT-WADSWORTH TO (ARTHUR-KILL) NEW-YORK BEACH EROSION CONTROL STUDY 6505GR0001
 ARTIFICIAL NA - STUDY OF AN (ARTIFICIAL) BATHING BEACH AT-ORCHARD-BEACH PELHAM-BAY NEW-YORK 3711GR0002
 THE CREATION OF AN (ARTIFICIAL) BEACH IN LARVOTTO-BAY MONTE-CARLO PRINCIPALITY OF MONACO 6809GR0004
 USE OF LONG GROINS AS (ARTIFICIAL) HEADLANDS 6510GR0002
 NA - (ARTIFICIAL) RESTORATION OF BEACHES WITH SPECIAL REGARD FOR BEACH FLUSHING NORDERNEY 1951-52 5700GR0014
 ARTIFICIALLY EFFECT OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF (ARTIFICIALLY) FILLED BEACH PRESQUE-ISLE PENINSULA 6805GR0001
 ASHTABULA NA - APPENDICES V AND X OHIO SHORE LINE OF LAKE-ERIE BETWEEN (ASHTABULA) AND THE PENNSYLVANIA STATE LINE BEACH EROSION CONTROL STUDY 5201GR0003

ASHTABULA (CONTINUED)
 NA - APPENDIXES III VII AND XII OHIO SHORE LINE OF LAKE-ERIE BETWEEN FAIRPORT AND [ASHTABULA] BEACH EROSION CONTROL STUDY 5201GR0002

ASPHALT
 NA - REPORT ON THE USE OF [ASPHALT] AT GROIN CONSTRUCTION IN DELFTLAND (HOLLAND) 4600GR0001
 NA - CONSTRUCTION OF A HEAVY DUNE COVER BY [ASPHALT] BASALT METHOD ON THE ISLAND OF BORKUM 5700GR0005
 NA - [ASPHALT] CONSTRUCTION IN GROIN BUILDING 5200GR0007
 [ASPHALT] GROINS 6204GR0001
 [ASPHALT] GROINS AND JETTIES 5511GR0002
 INTERIM REPORT ON [ASPHALT] GROINS AT OCEAN-CITY MARYLAND 5607GR0001
 BEHAVIOR OF SAND [ASPHALT] GROINS AT OCEAN-CITY MARYLAND 5905GR0001
 THE [ASPHALT] GROINS AT OCEAN-CITY MARYLAND 5504GR0001
 NA - [ASPHALT] GROINS IN USA 5600GR0008
 [ASPHALT] GROINS - TWO YEAR PLAN 5708GR0001
 NA - GROINS WITH [ASPHALT] GROUT IN EAST FRIESIAN COAST REGION 5900GR0002
 [ASPHALT] IN BEACH EROSION CONTROL STRUCTURES 6204GR0003
 APPLICATION OF [ASPHALT] IN HYDRAULIC ENGINEERING WORKS 5101GR0001
 NA - POSSIBILITIES AND LIMITS FOR APPLICATION OF [ASPHALT] TYPES OF CONSTRUCTIONS FOR COASTAL PROTECTION 5700GR0013

ATLANTIC
 THE [ATLANTIC] COAST OF LONG-ISLAND 6809GR0007
 NA - [ATLANTIC] COAST OF LONG-ISLAND FIRE-ISLAND INLET AND SHORE WESTERLY TO JONES INLET NEW-YORK 6503GR0002
 NA - [ATLANTIC] COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA-BAY NEW-YORK 6506GR0001
 LIFE OF STEEL SHEET PILE STRUCTURES IN [ATLANTIC] COASTAL STATES 5210GR0002
 THE PROTECTION AND PRESERVATION OF THE [ATLANTIC] SHORE FRONT OF THE STATE OF NEW-YORK 6207GR0002

ATLANTIC-BEACH
 NA - FORT-MACON - [ATLANTIC-BEACH] AND VICINITY NORTH-CAROLINA 6209GR0002

ATLANTIC-CITY
 NA - [ATLANTIC-CITY] NEW-JERSEY BEACH EROSION CONTROL STUDY 6407GR0002
 NA - [ATLANTIC-CITY] NEW-JERSEY BEACH EROSION CONTROL STUDY 5003GR0001

BAKERS-HAUOVER
 NA - BEACH EROSION STUDY OF [BAKERS-HAUOVER] INLET FLORIDA 4604GR0002

BALTIC-SEA
 NA - GENERAL COASTAL DYNAMICS AND COASTAL PROTECTION OF THE SOUTH [BALTIC-SEA] BETWEEN TRAVE AND SWINE 5400GR0005
 NA - WHAT HAPPENED TO PROTECTION OF OUR [BALTIC-SEA] COAST 5600GR0002
 NA - WATER ECONOMY BETWEEN NORTH AND [BALTIC-SEA] KIEL 5100GR0001
 NA - WATER ECONOMY BETWEEN NORTH-SEA AND [BALTIC-SEA] 1948-58 5800GR0005

BARNEGAT
 NA - SHORE OF NEW-JERSEY FROM SANDY-HOOK TO [BARNEGAT] INLET BEACH EROSION CONTROL STUDY 5603GR0001
 NA - SHORE OF NEW-JERSEY FROM SANDY-HOOK TO [BARNEGAT] INLET BEACH EROSION CONTROL STUDY 5802GR0002
 NA - SHORE OF NEW-JERSEY - [BARNEGAT] INLET TO CAPE-MAY-CANAL BEACH EROSION CONTROL STUDY 5908GR0001

BARRIERS
 NA - GROYNES AS [BARRIERS] TO MOVEMENT OF BEACH MATERIAL 6200GR0003

BASALT
 NA - CONSTRUCTION OF A HEAVY DUNE COVER BY ASPHALT [BASALT] METHOD ON THE ISLAND OF BORKUM 5700GR0005

BATHING
 NA - STUDY OF AN ARTIFICIAL [BATHING] BEACH AT ORCHARO-BEACH PELHAM-BAY NEW-YORK 3711GR0002

BEHAVIOR
 BEACH [BEHAVIOR] NORTH SHORE LONG-ISLAND SOUND 7011GR0001
 [BEHAVIOR] OF BEACH FILL AND BORROW AREA AT PROSPECT-BEACH WEST-HAVEN CONNECTICUT 6108GR0001
 [BEHAVIOR] OF BEACH FILL AT OCEAN-CITY NEW-JERSEY 5802GR0001
 [BEHAVIOR] OF BEACH FILLS IN NEW-ENGLAND 6102GR0001
 [BEHAVIOR] OF BEACH FILLS IN NEW-ENGLAND 6206GR0002
 A MODEL STUDY OF THE [BEHAVIOR] OF BEACHES AND GROYNES 6206GR0001
 EXPERIMENTAL STUDY OF THE HYDRAULIC [BEHAVIOR] OF GROYNES SYSTEMS 6809GR0003
 EXPERIMENTAL STUDY OF THE HYDRAULIC [BEHAVIOR] OF INCLINED GROYNES SYSTEMS 7009GR0003
 [BEHAVIOR] OF SAND ASPHALT GROINS AT OCEAN-CITY MARYLAND 5905GR0001

BELGIUM COAST PROTECTION ON THE NORTH-SEA COASTS OF HOLLAND, FRANCE [BELGIUM] AND GERMANY
 BELLE-PASS NA - [BELLE-PASS] TO RACCOON POINT LOUISIANA BEACH EROSION CONTROL STUDY
 BERRIEN NA - [BERRIEN] COUNTY MICHIGAN BEACH EROSION CONTROL STUDY
 BETTER [BETTER] JETTY FOR LESS MONEY
 BETWEEN NA - APPENDIXES V AND X OHIO SHORE LINE OF LAKE-ERIE [BETWEEN] ASHTABULA AND THE PENNSYLVANIA STATE LINE BEACH EROSION CONTROL STUDY
 NA - APPENDICES III VII AND XII OHIO SHORE LINE OF LAKE-ERIE [BETWEEN] FAIRPORT AND ASHTABULA BEACH EROSION CONTROL STUDY
 MOTION OF SAND PARTICLES [BETWEEN] GROINS
 NA - WATER ECONOMY [BETWEEN] NORTH AND BALTIC-SEA KIEL
 NA - WATER ECONOMY [BETWEEN] NORTH-SEA AND BALTIC-SEA 1948-58
 NA - SHORE [BETWEEN] PEABERTON POINT AND CAPE-COD MASSACHUSETTS BEACH EROSION CONTROL STUDY
 NA - GENERAL COASTAL DYNAMICS AND COASTAL PROTECTION OF THE SOUTH BALTIC-SEA [BETWEEN] TRAVE AND SWINE
 NA - APPENDIX VIII OHIO SHORE LINE OF LAKE-ERIE [BETWEEN] VERMILLION AND SHEFFIELD-LAKE-VILLAGE BEACH EROSION CONTROL STUDY
 BIOLOGICAL NA - [BIOLOGICAL] HELP IN COASTAL PROTECTION
 BISCAYNE NA - BEACH EROSION CONTROL REPORT ON COUPEHATIVE STUDY OF VIRGINIA AND [BISCAYNE] KEYS FLORIDA
 BITUMEN [BITUMEN] IN COASTAL ENGINEERING
 NA - HYDRAULIC STRUCTURES I GROINS DAMS DYKES AND CANAL EMBANKMENTS I OF [BITUMEN] TYPE
 BLOCK NA - REPORT ON CONCRETE [BLOCK] GROINS
 PRECAST CONCRETE [BLOCK] GROINS
 DETAIL OF CONCRETE [BLOCK] USED IN GROINS CONSTRUCTED AT MONTECITO CALIFORNIA
 BLOCKS CONCRETE [BLOCKS] FORM LOW-COST GROINS
 BOARDWALK CONEY ISLAND PUBLIC BEACH AND [BOARDWALK] IMPROVEMENT
 BORKUM NA - CONSTRUCTION OF A HEAVY DUNE COVER BY ASPHALT BASALT METHOD ON THE ISLAND OF [BORKUM]
 DIE SCHUTZBAUTEN AUF DER INSEL [BORKUM]
 BOROUGH CONSTRUCTION AND MAINTENANCE OF THE PUBLIC BEACH AT ROCKAWAY-BEACH [BOROUGH] OF QUEENS
 BORROW BEHAVIOR OF BEACH FILL AND [BORROW] AREA AT PROSPECT-BEACH WEST-HAVEN CONNECTICUT
 BOSTON SOME ASPECTS OF SHORE PROTECTION IN [BOSTON] HARBOR
 BRANDUNGSUNTERSUCH BRANDUNGSUNTERSUCHUNG AN DEN KUSTEN VON FEHMARN UND NORDWAGRIEN
 BREAKERS NA - [BRANDUNGSUNTERSUCHUNGEN] AN DEN KUSTEN VON FEHMARN UND NORDWAGRIEN
 TEST WITH SCALE MODELS TO DETERMINE THE EFFECT OF CURRENTS, AND [BREAKERS] UPON A SANDY BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROINS
 BREAKING NA - STEEP SHORE OF BROOKTON - CAUSE OF [BREAKING] ...
 BREAKWATER NA - APPENDIX II COAST OF CALIFORNIA POINT MUGU TO SAN-PEDRO [BREAKWATER] BEACH EROSION CONTROL STUDY
 BREAKWATERS VARIATION OF TOPOGRAPHY OF SEA-BED CAUSED BY THE CONSTRUCTION OF [BREAKWATERS]
 THE COASTAL DYNAMICS OF SAND WAVES AND THE INFLUENCE OF [BREAKWATERS] AND GROYNES

BREVARD NA - [BREVARD] COUNTY FLORIDA 6807GR0001
 BRODTEN NA - STEEP SHORE OF [BRODTEN] - CAUSE OF BREAKING ... 5300GR0005
 BROWARD NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO [BROWARD] COUNTY LINE BEACH EROSION CONTROL STUDY 6105GR0002
 BUDD THE [BUDD] HORIZONTALLY PERMEABLE GROIN SYSTEM FOR BEACH EROSION CONTROL AND REBUILDING SAND BEACHES 0000GR0006
 BUHNE NA - DIE WIRKUNG DER [BUHNE] H IN WANGERROOGE WEST AUF DIE SEEGAT 5200GR0004
 NA - APPENDIX VI HUMBOLDT-BAY ([BUHNE] POINT) CALIFORNIA BEACH EROSION CONTROL STUDY 5709GR0001
 BUHNEWIRKUNG NA - DIE [BUHNEWIRKUNG] 2806GR0002
 BUILD HOW TO [BUILD] A BEACH AT ECONOMY PRICES 5509GR0001
 BUILDING NA - ASPHALT CONSTRUCTION IN GROIN [BUILDING] 5200GR0007
 BUILT PERMEABLE JETTIES [BUILT] TO PROTECT CLEVELANDS SHORE 4507GR0001
 BULKHEADS CURVED JETTIES SEA-WALLS [BULKHEADS] AND RETAINING WALLS 4001GR0002
 BYRAM NA - AREAS 8 AND 11 SAUGATUCK RIVER TO [BYHAM] RIVER CONNECTICUT BEACH EROSION CONTROL STUDY 5705GR0003
 CABBAGE SHORE EROSION AND [CABBAGE] PALMETTO GROINS AT NORTH POINT ST.AUGUSTINE FLORIDA 3811GR0001
 CALIFORNIA NA - SPECIAL STUDY OF CITY OF SAN-DIEGO (SUNSET-CLIFFS) [CALIFORNIA] 6408GR0001
 NA - ANAHEIM-BAY HARBOR [CALIFORNIA] 5403GR0001
 NA - BEACH EROSION AT SANTA-BARBARA [CALIFORNIA] 3803GR0001
 NA - BEACH EROSION STUDY ORANGE COUNTY [CALIFORNIA] 4002GR0001
 NA - BEACH EROSION STUDY CORONADO [CALIFORNIA] 4202GR0001
 DETAIL OF CONCRETE BLOCK USED IN GROINS CONSTRUCTED AT MONTECITO [CALIFORNIA] 2802GR0001
 NA - SAN-DIEGO COUNTY [CALIFORNIA] APPENDIX IV PHASE 2 BEACH EROSION CONTROL STUDY 6009GR0001
 NA - SAN-GABRIEL RIVER TO NEWPORT-BAY ORANGE COUNTY [CALIFORNIA] APPENDIX V PHASE II BEACH EROSION CONTROL STUDY 6210GR0002
 NA - APPENDIX VI HUMBOLDT-BAY (BUHNE POINT) [CALIFORNIA] BEACH EROSION CONTROL STUDY 5709GR0001
 NA - OCEANSIDE OCEAN-BEACH IMPERIAL-BEACH AND CORONADO SAN-DIEGO COUNTY [CALIFORNIA] BEACH EROSION CONTROL STUDY 5405GR0001
 NA - SANTA-CRUZ COUNTY [CALIFORNIA] BEACH EROSION CONTROL STUDY 5705GR0004
 NA - APPENDIX I COAST OF [CALIFORNIA] CARPENTERIA TO POINT MUGU BEACH EROSION CONTROL STUDY 4812GR0006
 NA - APPENDIX II COAST OF [CALIFORNIA] POINT MUGU TO SAN-PEDRO BREAKWATER BEACH EROSION CONTROL STUDY 5210GR0007
 NA - COAST OF SOUTHERN [CALIFORNIA] - SPECIAL INTERIM REPORT ON THE VENTURA AREA COOPERATIVE BEACH EROSION CONTROL STUDY 5311GR0002
 6206GR0002
 CALIFORNIA'S [CALIFORNIA] BEACH EROSION AND DEVELOPMENT PROBLEMS 3610GR0001
 CAMP-PERRY EXPERIMENTAL GROINS [CAMP-PERRY] OHIO 5309GR0001
 CANAL NA - HYDRAULIC STRUCTURES (GROINS DAMS DYKES AND [CANAL] EMBANKMENTS) OF BITUMEN TYPE 5300GR0004
 CANTERBURY-BIGHT NA - BEACH EROSION AND COASTAL DEVELOPMENT IN THE [CANTERBURY-BIGHT] 6900GR0002
 CAPE-COD NA - SHORE BETWEEN PEMBERTON POINT AND [CAPE-COD] MASSACHUSETTS BEACH EROSION CONTROL STUDY 5910GR0001
 CAPE-MAY NA - COLD-SPRING INLET ([CAPE-MAY] HARBOR) NEW-JERSEY 5307GR0001

CAPE-MAY-CANAL
 NA - SHORE OF NEW-JERSEY - BARNEGAT INLET TO [CAPE-MAY-CANAL] BEACH EROSION CONTROL STUDY
 NA - NEW-JERSEY COAST OF DELAWARE-BAY FROM [CAPE-MAY-CANAL] TO MAURICE RIVER BEACH EROSION CONTROL STUDY
 CAROLINA-BEACH
 NA - [CAROLINA-BEACH] AND VICINITY NORTH-CAROLINA
 CARPENTERIA
 NA - APPENDIX I COAST OF CALIFORNIA [CARPENTERIA] TO POINT MUGU BEACH EROSION CONTROL STUDY
 CAUSE
 NA - STEEP SHORE OF BRUDTEN - [CAUSE] OF BREAKING ***
 CAUSED
 VARIATION OF TOPOGRAPHY OF SEA-BED [CAUSED] BY THE CONSTRUCTION OF BREAKWATERS
 CAUSES
 COAST EROSION AND PROTECTION - STUDIES IN [CAUSES] AND REMEDIES
 NA - [CAUSES] OF COAST EROSION AND ACCRETION
 CHAGRIN
 NA - APPENDIX XI OHIO SHORE LINE OF LAKE-ERIE EUCLID TO [CHAGRIN] RIVER BEACH EROSION CONTROL STUDY
 CHALK
 OBSERVATIONS ON THE TRAVEL OF SHORE MATERIAL ALONG A [CHALK] FORESHORE
 CHANGES
 NA - COASTAL [CHANGES] AND COASTAL PROTECTION OF THE ISLAND HIDDENSEE
 NA - SURGE AND SHORE [CHANGES] ON THE WEST COAST OF SYLT
 CHARACTERISTICS
 NA - ON THE FLOW [CHARACTERISTICS] IN THE VICINITY OF GROINS
 [CHARACTERISTICS] OF SHINGLE BEACHES: THE SOLUTION TO SOME PRACTICAL PROBLEMS
 CHATHAM
 NA - [CHATHAM] MASSACHUSETTS BEACH EROSION CONTROL STUDY
 CHECK
 NA - PERMEABLE GROINS OF CONCRETE [CHECK] BEACH EROSION
 CLARK
 NA - [CLARK] POINT NEW-BEDFORD MASSACHUSETTS BEACH EROSION CONTROL STUDY
 CLEVELAND
 NA - [CLEVELAND] AND LAKEWOOD OHIO BEACH EROSION CONTROL STUDY
 CLEVELANDS
 PERMEABLE JETTIES BUILT TO PROTECT [CLEVELANDS] SHORE
 CLIFF [CLIFF] DRAINAGE AND BEACH DISTRIBUTION
 COCHIN
 SHORELINE ADVANCEMENT BY SEA-WALL AND GROYNES AT [COCHIN]
 RECEDING OF SHORELINE AT [COCHIN] BY GROYNES AND A SEAWALL
 COLD-SPRING
 NA - [COLD-SPRING] INLET (CAPE-MAY HARBOR) NEW-JERSEY
 COLONIAL-BEACH
 NA - [COLONIAL-BEACH] VIRGINIA BEACH EROSION CONTROL STUDY
 COLORED
 [COLORED] SAND TESTS WITH LUMINESCENT SAND IN GROIN FIELDS
 COMMUNITY
 NA - SHORE OF SHEFFIELD-LAKE [COMMUNITY] PARK OHIO BEACH EROSION CONTROL STUDY
 COMPO-BEACH
 NA - BEACH EROSION AT [COMPO-BEACH] WESTPORT CONNECTICUT
 PHOTOGRAPHS OF [COMPO-BEACH] WESTPORT CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT
 CONCRETE
 PIERS AND JETTIES OF PRECAST [CONCRETE]
 NA - REPORT ON [CONCRETE] BLOCK GROINS
 PRECAST [CONCRETE] BLOCK GROINS
 DETAIL OF [CONCRETE] BLOCK USED IN GROINS CONSTRUCTED AT MONTECITO CALIFORNIA
 [CONCRETE] BLOCKS FORM LOW-COST GROINS
 NA - PERMEABLE GROINS OF [CONCRETE] CHECK BEACH EROSION

5908GR0001
 6106GR0001
 6205GR0002
 5210GR0007
 5300GR0005
 7009GR0007
 5200GR0002
 2600GR0001
 5402GR0001
 5409GR0005
 5600GR0007
 5500GR0007
 5511GR0004
 7009GR0006
 5704GR0001
 3500GR0001
 6209GR0003
 5003GR0002
 4507GR0001
 6809GR0006
 6008GR0003
 5900GR0004
 5307GR0001
 4909GR0001
 7000GR0001
 6205GR0001
 3506GR0001
 5705GR0001
 4602GR0002
 5205GR0001
 5304GR0001
 2902GR0001
 5204GR0002
 3500GR0001

CONCRETE (CONTINUED)
USE OF [CONCRETE] FOR SHORE PROTECTION
[CONCRETE] SHORE PROTECTION
[CONCRETE] SHORE PROTECTION STRUCTURES

CONDITIONS
COASTAL PROTECTION PROCEDURES WITH SPECIAL REFERENCE TO [CONDITIONS] IN FLORIDA
REVIEW OF BEACH EROSION AND STORM TIDE [CONDITIONS] IN FLORIDA 1961-1962

CONEY
[CONEY] ISLAND PUBLIC BEACH AND BOARDWALK IMPROVEMENT

CONGRESS
REPORT TO THE 21ST INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 22ND INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 22ND INTERNATIONAL NAVIGATION [CONGRESS]
NA - REPORT TO THE 22ND INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
NA - REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
NA - REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
NA - REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 18TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 17TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 15TH INTERNATIONAL NAVIGATION [CONGRESS]
REPORT TO THE 15TH INTERNATIONAL NAVIGATION [CONGRESS]

CONNECTICUT
BEHAVIOR OF BEACH FILL AND BORROW AREA AT PROSPECT-BEACH WEST-HAVEN [CONNECTICUT]
NA - BEACH EROSION AT COMPO-BEACH WESTPORT [CONNECTICUT]
HAWKS-NEST-BEACH [CONNECTICUT]
PHOTOGRAPHS OF SASCO-HILL-BEACH FAIRFIELD [CONNECTICUT] AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT
PHOTOGRAPHS OF COMPO-BEACH WESTPORT [CONNECTICUT] AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT
NA - THAMES RIVER TO NANTIC-HAY [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 9 EAST RIVER TO NEW-HAVEN HARBOR [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 8 AND 11 SAUGATUCK RIVER TO BYRAM RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 2 - HAMMONASSET RIVER TO EAST RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 6 - NANTIC-HAY TO CONNECTICUT RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 1 - ASH CREEK TO SAUGATUCK RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 3 - HOUSATONIC RIVER TO ASH CREEK [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 3 - NEW-HAVEN HARBOR TO HOUSATONIC RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 5 - PAMCATUCK RIVER TO THAMES RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 4 - CONNECTICUT RIVER TO HAMMONASSET RIVER [CONNECTICUT] BEACH EROSION CONTROL STUDY
NA - AREA 6 - NANTIC-HAY TO [CONNECTICUT] RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
NA - AREA 4 - [CONNECTICUT] RIVER TO HAMMONASSET RIVER CONNECTICUT BEACH EROSION CONTROL STUDY

CONSERVATION
NA - CULTIVATED LAND [CONSERVATION] AND RECLAMATION

CONSTRUCTED
DETAIL OF CONCRETE BLOCK USED IN GROINS [CONSTRUCTED] AT MONTECITO CALIFORNIA

CONSTRUCTION
NA - MODEL TESTS WITH MOVEABLE FLOOR IN SEA AND SEA HARBOR [CONSTRUCTION]
THE PRINCIPLE OF INCREASING PERMEABILITY IN GROIN [CONSTRUCTION]
GALVESTON-BEACH [CONSTRUCTION]
PHOTOGRAPHS OF COMPO-BEACH WESTPORT CONNECTICUT AFTER GROIN [CONSTRUCTION] AND BEFORE FILL PLACEMENT
PHOTOGRAPHS OF SASCO-HILL-BEACH FAIRFIELD CONNECTICUT AFTER GROIN [CONSTRUCTION] AND BEFORE FILL PLACEMENT
[CONSTRUCTION] AND MAINTENANCE OF THE PUBLIC BEACH AT ROCKAWAY-BEACH BOROUGH OF QUEENS
A NEW METHOD OF [CONSTRUCTION] IN COAST EROSION CONTROL
NA - REPORT ON THE USE OF ASPHALT AT GROIN [CONSTRUCTION] IN DELFTLAND (HOLLAND)
NA - ASPHALT [CONSTRUCTION] IN GROIN BUILDING
NA - [CONSTRUCTION] OF A HEAVY DUNE COVER BY ASPHALT BASALT METHOD ON THE ISLAND OF BORKUM

CONSTRUCTION (CONTINUED)
 VARIATION OF TOPOGRAPHY OF SEA-BED CAUSED BY THE [CONSTRUCTION] OF BREAKWATERS
 DESIGN AND [CONSTRUCTION] OF GROINS
 TIMBER IN THE [CONSTRUCTION] OF SEA DEFENCE AND RIVER WORKS
 DESIGN AND [CONSTRUCTION] OF THE SEAL-BEACH GROIN
 EARLY ATTEMPTS AT INLET [CONSTRUCTION] ON THE FLORIDA EAST COAST
 [CONSTRUCTION] WORKS FOR THE PROTECTION OF THE COASTS

CONSTRUCTIONS
 NA - POSSIBILITIES AND LIMITS FOR APPLICATION OF ASPHALT TYPES OF [CONSTRUCTIONS] FOR COASTAL PROTECTION

CONTRACTOR
 A [CONTRACTOR] BATTLES THE TIDES

COOPERATIVE
 NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL INTERIM REPORT ON THE VENTURA AREA [COOPERATIVE] BEACH EROSION CONTROL STUDY
 NA - VIRGINIA-BEACH VIRGINIA [COOPERATIVE] BEACH EROSION CONTROL STUDY
 NA - FIRE-ISLAND INLET TO JONES INLET LONG-ISLAND NEW-YORK [COOPERATIVE] BEACH EROSION CONTROL STUDY
 NA - BEACH EROSION CONTROL REPORT ON [COOPERATIVE] STUDY OF VIRGINIA AND BISCAYNE KEYS FLORIDA

CORONADO
 NA - BEACH EROSION STUDY [CORONADO] CALIFORNIA
 NA - OCEANSIDE OCEAN-BEACH IMPERIAL-BEACH AND [CORONADO] SAN-DIEGO COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY

COST
 LOW [COST] SHORE PROTECTION USED ON THE GREAT-LAKES

COSTA
 NA - PROTECCAO DA [COSTA] CONTRA A EROSAO MARITIMA E FORMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA COSTA DE MOCAMBIQUE
 NA - PROTECCAO DA COSTA CONTRA A EROSAO MARITIMA E FORMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA [COSTA] DE MOCAMBIQUE

COSTS
 CERTAIN POINTS ABOUT EROSION [COSTS] AND MEASURES OF PROTECTION

COUNTY
 REPORT OF ADVISORY-BOARD ON BEACH PROTECTION LOS-ANGELES [COUNTY]
 NA - BEACH EROSION STUDY ORANGE [COUNTY] CALIFORNIA
 NA - SAN-DIEGO [COUNTY] CALIFORNIA APPENDIX IV PHASE 2 BEACH EROSION CONTROL STUDY
 NA - SAN-GABRIEL RIVER TO NEWPORT-BAY ORANGE [COUNTY] CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY
 NA - OCEANSIDE OCEAN-BEACH IMPERIAL-BEACH AND CORONADO SAN-DIEGO [COUNTY] CALIFORNIA BEACH EROSION CONTROL STUDY
 NA - SANTA-CRUZ [COUNTY] CALIFORNIA BEACH EROSION CONTROL STUDY
 NA - BEACH EROSION CONTROL STUDY ST. JOHNS [COUNTY] FLORIDA
 NA - BREVAR [COUNTY] FLORIDA
 NA - DUVAL [COUNTY] FLORIDA
 NA - DADE [COUNTY] FLORIDA
 NA - PINELLAS [COUNTY] FLORIDA
 NA - PINELLAS [COUNTY] FLORIDA
 NA - PALM-BEACH [COUNTY] FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
 PHOTOGRAPHS OF SARASOTA [COUNTY] FLORIDA SHOWING GROIN INSTALLATION
 NA - PALM-BEACH [COUNTY] FROM LAKE-WORTH INLET TO SOUTH-LAKE-WORTH INLET FLORIDA BEACH EROSION CONTROL STUDY
 NA - MANITOWOC [COUNTY] FROM TWO-RIVERS TO MANITOWOC WISCONSIN BEACH EROSION CONTROL STUDY
 NA - PALM-BEACH [COUNTY] FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO BROWARD [COUNTY] LINE BEACH EROSION CONTROL STUDY
 NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN [COUNTY] LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
 NA - BERRIEN [COUNTY] MICHIGAN BEACH EROSION CONTROL STUDY
 NA - HARRISON [COUNTY] MISSISSIPPI BEACH EROSION CONTROL STUDY
 NA - NIAGARA [COUNTY] NEW-YORK BEACH EROSION STUDY

COUNTY (CONTINUED)
 NA - APPENDIX IX - SHORE OF LAKE-ERIE IN LAKE [COUNTY] OHIO BEACH EROSION CONTROL STUDY
 NA - BEACH EROSION STUDY LAKE-MICHIGAN SHORE LINE OF MILWAUKEE [COUNTY] WISCONSIN
 NA - RACINE [COUNTY] WISCONSIN BEACH EROSION CONTROL STUDY
 COVER NA - CONSTRUCTION OF A HEAVY DUNE [COVER] BY ASPHALT BASALT METHOD ON THE ISLAND OF BORKUM
 CREEK NA - AREA 7 - HOUSATONIC RIVER TO ASH [CREEK] CONNECTICUT BEACH EROSION CONTROL STUDY
 DUBAI [CREEK] ENTRANCE
 NA - AREA 1 - ASH [CREEK] TO SAUGATUCK RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
 CURRENTS TEST WITH SCALE MODELS TO DETERMINE THE EFFECT OF [CURRENTS] AND BREAKERS UPON A SANDY BEACH AND THE
 ADVANTAGEOUS INSTALLATION OF GROINS
 THE RELATION OF THE ACTION OF WAVES AND [CURRENTS] ON HEADLANDS TO THE CONTROL OF SHORE EROSION BY GROINS
 CURVED [CURVED] GROINS AND FORESHORE DEFENCE
 [CURVED] JETTIES SEA-WALLS BULKHEADS AND RETAINING WALLS
 DADE NA - [DADE] COUNTY FLORIDA
 DAMAGE RECENT STORM [DAMAGE] ALONG THE COASTS OF FLORIDA AND MISSISSIPPI
 DAMS NA - HYDRAULIC STRUCTURES (GROINS [DAMS] DYKES AND CANAL EMBANKMENTS) OF BITUMEN TYPE
 DANISH THE [DANISH] WESTCOAST - LITTORAL DRIFT PROBLEMS AND MEASURES AGAINST COAST EROSION
 DATA SOME [DATA] ON BEACH PROTECTION WORKS
 DECLINE NA - ORIGIN AND [DECLINE] OF THE ISLAND TRISCHEN
 DEFENCE CURVED GROINS AND FORESHORE [DEFENCE]
 COAST EROSION AND [DEFENCE]
 FUNDAMENTALS OF COAST EROSION AND [DEFENCE]
 COASTAL PROTECTION REVIEW OF METHODS FOR [DEFENCE]
 TIMBER IN THE CONSTRUCTION OF SEA [DEFENCE] AND RIVER WORKS
 LES OUVAGES DE [DEFENCE] CONTRE LA MER SUR LA COTE FRANCAISE DE LOCEAN ENTRE LA LOIRE ET LA GIRONDE
 SEA [DEFENCE] EROSION AND PROTECTION ON A SANDY COAST
 NA - SEA [DEFENCE] GROYNES
 NA - SEA [DEFENCE] GROYNES - 4
 COASTAL [DEFENCE] WORKS
 SOME SEA [DEFENCE] WORKS FOR RECLAIMED LANDS
 NA - SEA [DEFENCE] WORKS - GROINS AND REVETMENTS
 DEFENCE PROBLEMS DE [DEFENCE] DES COTES RESUSSITE DE ECHECS DE QUELQUES OUVRAGES
 DELAWARE NA - [DELAWARE] COAST FROM KITTS-HUMMOCK TO FENWICK ISLAND BEACH EROSION CONTROL STUDY
 DELAWARE-BAY NA - NEW-JERSEY COAST OF [DELAWARE-BAY] FROM CAPE-MAY-CANAL TO MAURICE RIVER BEACH EROSION CONTROL STUDY
 DELFTLAND NA - REPORT ON THE USE OF ASPHALT AT GROIN CONSTRUCTION IN [DELFTLAND] (HOLLAND)
 DESIGN VARIATIONS IN GROIN [DESIGN]
 VARIATIONS IN GROIN [DESIGN]
 SHORE PROTECTION PLANNING AND [DESIGN]
 [DESIGN] AND CONSTRUCTION OF GROINS
 [DESIGN] AND CONSTRUCTION OF THE SEAL-BEACH GROIN
 SUMMARY STATEMENT CONCERNING IMPORTANCE OF A GROIN [DESIGN] CRITERION

DESIGN (CONTINUED)
 NA - SWELL AND SURGE AS BASIS FOR PLANNING AND [DESIGN] IN SEA STRUCTURES AND COASTAL PROTECTION
 NA - A SCIENTIFIC BASIS FOR [DESIGN] OF GROUPE SYSTEMS
 5800GR0007
 6100GR0002

DETAIL [DETAIL] OF CONCRETE BLOCK USED IN GROINS CONSTRUCTED AT MONTECITO CALIFORNIA
 2902GR0001

DETERIORATION [DETERIORATION] OF STEEL SHEET PILE GROINS AT PALM-BEACH FLORIDA
 4910GR0001

DEUTSCHEN NA - ALLGEMEINE EMPFEHLUNGEN FÜR DEN [DEUTSCHEN] KUSTENSCHUTZ
 5500GR0002

DEVELOPMENT [DEVELOPMENT] AND COASTAL PROTECTION
 COASTAL STUDY OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL TRANSPORT EQUIPMENT [DEVELOPMENT] AND INITIAL TESTS
 5511GR0001

NA - BEACH EROSION AND COASTAL [DEVELOPMENT] IN THE CANTERBURY-BIGHT
 NA - THE EFFECT OF ISLAND PROTECTIVE STRUCTURES ON BEACH [DEVELOPMENT] IN WEST PART OF NORDERNEY
 COAST EROSION AND THE [DEVELOPMENT] OF BEACH PROFILES
 5906GR0001
 5900GR0002
 5406GR0001

THE [DEVELOPMENT] OF COAST PROFILES ON A RECEIVING COAST PROTECTED BY GROYNES
 6008GR0002

NA - ORIGIN AND [DEVELOPMENT] OF ISLAND PROTECTIVE WORKS ON NORDERNEY
 LITTORAL PROCESSES AND THE [DEVELOPMENT] OF SHORELINES
 5500GR0006
 6510GR0004
 5210GR0005
 3610GR0001

DISCUSSION
 CALIFORNIA'S BEACH EROSION AND [DEVELOPMENT] PROBLEMS
 3604GR0001

ROUND-TABLE [DISCUSSION] OF SHORE PROBLEMS IN RELATION TO RECREATION
 3710GR0001

DISTRIBUTION
 CLIFF DRAINAGE AND BEACH [DISTRIBUTION]
 EFFECT OF PARTICLE SIZE AND [DISTRIBUTION] ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE PENINSULA
 6809GR0006
 6805GR0001

DIVISION [DIVISION] OF SHORE EROSION - OHIO
 5510GR0002

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 CLIFF [DRAINAGE] AND BEACH DISTRIBUTION
 6809GR0006

DRIFT PROTECTION OF COASTS AGAINST THE SEA WITH OR WITHOUT PREPUNERATING COASTAL [DRIFT] OF MATERIALS
 LITTORAL [DRIFT] PROBLEM AT SHORE-LINE HARBORS
 3202GR0001
 5900GR0003
 5008GR0001

DUBAI [DUBAI] CREEK ENTRANCE
 6809GR0008

DUNE NA - CONSTRUCTION OF A HEAVY [DUNE] COVER BY ASPHALT BASALT METHOD ON THE ISLAND OF BORKUM
 5700GR0005
 5800GR0003

DURABILITY NA - [DUNE] PROTECTIVE WORKS ON SVLT
 5202GR0001

DURBIN [DURBIN] OF STEEL SHEET PILING IN SHORE STRUCTURES
 6207GR0001

DUTCH THE NEARSHORE MOVEMENT OF SAND AT [DURBIN]
 THE HISTORY OF THE [DUTCH] COAST IN THE LAST CENTURY
 A MATHEMATICAL THEORY ABOUT SAND WAVES AND ITS APPLICATION ON THE [DUTCH] WADDEN ISLE OF VLIELAND
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 6810GR0001

DUVAL NA - [DUVAL] COUNTY FLORIDA
 DUJ-PLAT-TAYLOR
 DUJ-PLAT-TAYLOR] ADJUSTABLE SCREW PILE GROYNES
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 3306GR0001

DYED SEA GROINS EFFECTIVENESS INVESTIGATIONS BY [DYED] SAND TESTS
 6600GR0001

DYKES NA - HYDRAULIC STRUCTURES (GROINS DAMS [DYKES] AND CANAL EMBANKMENTS) OF BITUMEN TYPE
 NA - MODEL TESTS OF WAVE RUN-UP ON SEA [DYKES] IN WATT REGION
 5300GR0004
 5400GR0004

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|---------------|--|------------|
| DYNAMICS | NA - GENERAL COASTAL (DYNAMICS) AND COASTAL PROTECTION OF THE SOUTH BALTIC-SEA BETWEEN TRAVE AND SWINE | 5400GR0005 |
| | NA - SOME IDEAS ON THE PROBLEM OF RESEARCH IN COASTAL (DYNAMICS) AND MODEL TESTS OF COASTAL PROTECTION | 5400GR0001 |
| | ONE ASPECT OF THE (DYNAMICS) OF A COAST PARTLY PROTECTED BY A ROW OF GROYNES | 0000GR0001 |
| | THE (DYNAMICS) OF A COAST WITH A GROYNES SYSTEM | 6009GR0001 |
| | THE (DYNAMICS) OF A COAST WITH A GROYNES SYSTEM | 7009GR0008 |
| | THE COASTAL (DYNAMICS) OF SAND WAVES AND THE INFLUENCE OF BREAKWATERS AND GROYNES | 0000GR0002 |
| EARLY | EARLY (EARLY) ATTEMPTS AT INLET CONSTRUCTION ON THE FLORIDA EAST COAST | 3807GR0001 |
| EAST | EARLY ATTEMPTS AT INLET CONSTRUCTION ON THE FLORIDA (EAST) COAST | 3807GR0001 |
| | COAST PROTECTION SOME RECENT WORKS ON THE (EAST) COAST 1942-52 | 5306GR0001 |
| | NA - ISLAND PROTECTION ON (EAST) FRIESIAN COAST | 5600GR0003 |
| | NA - GROINS WITH ASPHALT GROUT IN (EAST) FRIESIAN COAST REGION | 5900GR0002 |
| | NA - AREA 2 - HAMMONSET RIVER TO (EAST) RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5002GR0001 |
| | NA - AREA 9 (EAST) RIVER TO NEW-HAVEN HARBOUR CONNECTICUT BEACH EROSION CONTROL STUDY | 5605GR0002 |
| | NA - ATLANTIC COAST OF NEW-YORK-CITY FROM (EAST) ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA-BAY NEW-YORK | 5606GR0001 |
| ECHECS | PROBLEMS DE DEFENSE DES COTES RESUSITE DE (ECHECS) DE QUELQUES OUVRAGES | 5409GR0003 |
| ECONOMY | NA - MANUAL OF WATER (ECONOMY) | 5800GR0006 |
| | NA - WATER (ECONOMY) BETWEEN NORTH AND BALTIC-SEA KIEL | 5100GR0001 |
| | NA - WATER (ECONOMY) BETWEEN NORTH-SEA AND BALTIC-SEA | 5800GR0005 |
| | NA - WHAT WATER (ECONOMY) EXPECTS FROM COASTAL RESEARCH | 5500GR0004 |
| | HOW TO BUILD A BEACH AT (ECONOMY) PRICES | 5509GR0001 |
| EFFECT | AN EXPERIMENTAL STUDY ON THE (EFFECT) OF COASTAL GROINS | 5810GR0001 |
| | TEST WITH SCALE MODELS TO DETERMINE THE (EFFECT) OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROINS | 2806GR0001 |
| | LABORATORY STUDY OF THE (EFFECT) OF GROINS ON THE RATE OF LITTORAL TRANSPORT EQUIPMENT DEVELOPMENT AND INITIAL TESTS | 5906GR0001 |
| | THE (EFFECT) OF GROYNES ON ERODED BEACHES | 7009GR0005 |
| | NA - THE (EFFECT) OF GROYNES ON STABLE BEACHES | 6809GR0002 |
| | NA - THE (EFFECT) OF ISLAND PROTECTIVE STRUCTURES ON BEACH DEVELOPMENT IN WEST PART OF NORDERNEY | 5500GR0008 |
| | (EFFECT) OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE PENINSULA PENNSYLVANIA | 6805GR0001 |
| EFFECTIVENESS | SEA GROINS (EFFECTIVENESS) INVESTIGATIONS BY DYED SAND TESTS | 6600GR0001 |
| | (EFFECTIVENESS) OF GROINS AT ROCKAWAY-BEACH LONG-ISLAND NEW-YORK | 3812GR0001 |
| | (EFFECTIVENESS) OF PERMEABLE TYPE GROINS USED FOR BEACH PROTECTION AT SHOREWOOD WISCONSIN AND OTHER CITIES | 3911GR0001 |
| | ALONG THE WEST SHORE OF LAKE-MICHIGAN | 6300GR0001 |
| EFFECTS | NA - AN INVESTIGATION INTO THE (EFFECTIVENESS) OF VARIOUS TYPES OF GROYNES ON SEAFORD-BEACH | 6008GR0001 |
| | SCALE (EFFECTS) IN MODELS WITH LITTORAL SAND DRIFT | 5700GR0011 |
| | NA - (EFFECTS) OF COASTAL PROTECTIVE STRUCTURES ON SYLT | 5511GR0006 |
| | NA - ON THE (EFFECTS) OF GROINS | 6400GR0002 |
| | (EFFECTS) OF LARGE STRUCTURES ON THE OHIO SHORE OF LAKE-ERIE | 6510GR0003 |
| | GROINS AND (EFFECTS) - MINIMIZING LIABILITIES | 5700GR0008 |
| ELLENBOGENS | NA - DIE ABRUCHURSACHEN AN DER NORDWESTKUSTE DES (ELLENBOGENS) AUF SYLT | 5300GR0004 |
| EMBANKMENTS | NA - HYDRAULIC STRUCTURES (GROINS DAMS DYKES AND CANAL (EMBANKMENTS)) OF BITUMEN TYPE | 6306GR0002 |
| EMERGENCY | (EMERGENCY) MEASURES TO COMBAT BEACH EROSION | 6504GR0001 |
| EMPFEHLUNGEN | (EMERGENCY) METHODS TO COMBAT BEACH EROSION | 5500GR0002 |
| | NA - ALLGEMEINE (EMPFEHLUNGEN) FUR DEN DEUTSCHEN KUSTENSCHUTZ | |

ENGINEERING
 OCEANOGRAPHICAL [ENGINEERING]
 BITUMEN IN COASTAL [ENGINEERING]
 NA - SUITABILITY OF MODEL TESTS IN MARITIME [ENGINEERING] IN HARBORS SEAWAYS AND COASTAL PROTECTION
 SOME COASTAL [ENGINEERING] PROBLEMS IN INDIA
 COASTAL [ENGINEERING] STRUCTURES
 COASTAL [ENGINEERING] STUDY AT POMPAHO-BEACH
 APPLICATION OF ASPHALT IN HYDRAULIC [ENGINEERING] WORKS
 ENGINEERS
 BEACH PROTECTION [ENGINEERS] ATTEMPT TO OUTFIT NATURE AT PRESQUE-ISLE PENINSULA
 ENTRANCE
 DUBAI CREEK [ENTRANCE]
 ENTRE
 LES OUVAGES DE DEFENCE CONTRE LA MER SUR LA COTE FRANCAISE DE LOCEAN [ENTRE] LA LOIRE ET LA GIRONDE
 ENTWASSERUNG
 NA - SCHUTZ UND ENTWASSERUNG DER NIEUERUNGSGEBIETE AN DER SCHLESWIG-HOLSTEINISCHEN OSTSEEKUSTE
 EQUIPMENT
 LABORATORY STUDY OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL TRANSPORT [EQUIPMENT] DEVELOPMENT AND INITIAL TESTS
 ERIE
 NA - PRESQUE-ISLE PENINSULA [ERIE] PENNSYLVANIA BEACH EROSION CONTROL STUDY
 NA - PRESQUE-ISLE PENINSULA [ERIE] PENNSYLVANIA BEACH EROSION CONTROL STUDY
 ERODED
 THE EFFECT OF GROYNES ON [ERODED] BEACHES
 EROSAO
 NA - PROTECCAO DA COSTA CONTRA A [EROSAO] MARITIMA E FORMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA COSTA DE MOCAMBIQUE.
 EROSION
 EMERGENCY MEASURES TO COMBAT BEACH [EROSION]
 EMERGENCY METHODS TO COMBAT BEACH [EROSION]
 COAST [EROSION]
 THE DANISH WESTCOAST - LITTORAL DRIFT PROBLEMS AND MEASURES AGAINST COAST [EROSION]
 THE PROBLEM OF COAST [EROSION]
 THE PREVENTION OF COAST [EROSION]
 COAST [EROSION]
 THE PREVENTION OF COAST [EROSION]
 SAND MOVEMENT AND BEACH [EROSION]
 NA - PERMEABLE GROINS OF CONCRETE CHECK BEACH [EROSION]
 STUDY OF [EROSION] ALONG HONER SPIT AND VICINITY KACHEMAK-BAY ALASKA
 PAPER ON PROTECTIVE WORKS ADAPTED TO LIMIT [EROSION] ALONG THE OPEN COAST HOW THEY WORK
 NA - CAUSES OF COAST [EROSION] AND ACCRETION
 SHORE [EROSION] AND CABBAGE PALMETTO GROINS AT NORTH POINT ST.AUGUSTINE FLORIDA
 NA - BEACH [EROSION] AND COASTAL DEVELOPMENT IN THE CANTERBURY-BIGHT
 COAST [EROSION] AND DEFENCE
 FUNDAMENTALS OF COAST [EROSION] AND DEFENCE
 CALIFORNIA BEACH [EROSION] AND DEFENCE
 COAST [EROSION] AND FRESHWATER PROBLEMS
 [EROSION] AND PALMETTO GROINS AT NORTH POINT ST.AUGUSTINE FLORIDA
 SEA DEFENCE [EROSION] AND PROTECTION ON A SANDY COAST
 COAST [EROSION] AND PROTECTION ON LONG-ISLAND AND NEW-JERSEY
 BEACH [EROSION] AND PROTECTION WORKS IN IMAZU-SAKANO-BEACH
 COAST [EROSION] AND PROTECTION - STUDIES IN CAUSES AND REMEDIES
 REVIEW OF BEACH [EROSION] AND STORM TIDE CONDITIONS IN FLORIDA 1961-1962
 COAST [EROSION] AND THE DEVELOPMENT OF BEACH PROFILES
 NA - BEACH [EROSION] AT COMPU-BEACH WESTPORT CONNECTICUT
 NA - BEACH [EROSION] AT FOLLY-BEACH SOUTH-CAROLINA
 NA - BEACH [EROSION] AT GALVESTON TEXAS

EROSION

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MEASURES AGAINST [EROSION] AT GROINS AND JETTIES
 NA - BEACH [EROSION] AT HOLLYWOOD-BEACH FLORIDA
 NA - BEACH [EROSION] AT JACOB-HILLS PARK LONG-ISLAND NEW-YORK
 NA - BEACH [EROSION] AT MANASQUAN INLET NEW-JERSEY AND ADJACENT BEACHES
 NA - BEACH [EROSION] AT MANASQUAN INLET NEW-JERSEY AND ADJACENT BEACHES
 NA - BEACH [EROSION] AT SANTA-BARBARA CALIFORNIA
 NA - BEACH [EROSION] AT TILGHMAN POINT MARYLAND
 NA - BEACH [EROSION] AT WILLOUGHBY SPIT VIRGINIA
 THE RELATION OF THE ACTION OF WAVES AND CURRENTS ON HEADLANDS TO THE CONTROL OF SHORE [EROSION] BY GROINS
 A NEW METHOD OF CONSTRUCTION IN COAST [EROSION] CONTROL
 MAN AGAINST THE SEA A GUIDE TO [EROSION] CONTROL
 THE BUDD HORIZONTALLY PERMEABLE GROUT SYSTEM FOR BEACH [EROSION] CONTROL AND REBUILDING SAND BEACHES
 [EROSION] CONTROL AT WHITESVILLE-BEACH
 [EROSION] CONTROL IN NEW-ENGLAND
 BEACH [EROSION] CONTROL REPORT ON COOPERATIVE STUDY OF VIRGINIA AND BISCAYNE KEYS FLORIDA
 ASPHALT IN BEACH [EROSION] CONTROL STRUCTURES
 NA - SAN-GABRIEL RIVER TO NEWPORT-BAY ORANGE COUNTY CALIFORNIA APPENDIX V PHASE II BEACH [EROSION] CONTROL STUDY
 NA - AMELIA ISLAND FLORIDA BEACH [EROSION] CONTROL STUDY
 NA - AREAS 8 AND 11 SAUGATUCK RIVER TO BYHAM RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
 NA - SAN-JUAN PUERTO-RICO BEACH [EROSION] CONTROL STUDY
 NA - SANTA-CRUZ COUNTY CALIFORNIA BEACH [EROSION] CONTROL STUDY
 NA - SHORE OF NEW-JERSEY FROM SANDY-HOOK TO BARNEGAT INLET BEACH [EROSION] CONTROL STUDY
 NA - PALM-BEACH COUNTY FROM LAKE-WORTH INLET TO SOUTH-LAKE-NORTH INLET FLORIDA BEACH [EROSION] CONTROL STUDY
 NA - APPENDIX VI HUMBOLDT-BAY (BURNIE POINT) CALIFORNIA BEACH [EROSION] CONTROL STUDY
 NA - WAIKIKI-BEACH OAHU HAWAII BEACH [EROSION] CONTROL STUDY
 NA - CHATHAM MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
 NA - SHORE OF NEW-JERSEY - BARNEGAT INLET TO CAPE-MAY-CANAL BEACH [EROSION] CONTROL STUDY
 NA - SHORE OF THE STATE OF NEW-HAMPSHIRE BEACH [EROSION] CONTROL STUDY
 NA - VIRGINIA-BEACH VIRGINIA COOPERATIVE BEACH [EROSION] CONTROL STUDY
 NA - THAMES RIVER TO NANTIC-HAY CONNECTICUT BEACH [EROSION] CONTROL STUDY
 NA - CLARK POINT NEW-BEDFORD MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
 NA - SOUTH-KINGSTON AND WESTERLY RHODE-ISLAND BEACH [EROSION] CONTROL STUDY
 NA - PERTH-AMBOY NEW-JERSEY BEACH [EROSION] CONTROL STUDY
 NA - STATION ISLAND FORT-WAUDSWORTH TO ARTHUR-KILL NEW-YORK BEACH [EROSION] CONTROL STUDY
 NA - DELAWARE COAST FROM KITTS-HUMMOCK TO FENWICK ISLAND BEACH [EROSION] CONTROL STUDY
 NA - BERRIEN COUNTY MICHIGAN BEACH [EROSION] CONTROL STUDY
 NA - HALEIWA-BEACH OAHU HAWAII BEACH [EROSION] CONTROL STUDY
 NA - NEW-JERSEY COAST OF DELAWARE-BAY FROM CAPE-MAY-CANAL TO MAURICE RIVER BEACH [EROSION] CONTROL STUDY
 NA - SAN-DIEGO COUNTY CALIFORNIA APPENDIX IV PHASE 2 BEACH [EROSION] CONTROL STUDY
 NA - BELLE-PASS TO RACCOON POINT LOUISIANA BEACH [EROSION] CONTROL STUDY
 NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL INTERIM REPORT ON THE VENTURA AREA COOPERATIVE BEACH [EROSION] CONTROL STUDY
 NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-NORTH INLET TO BROWARD COUNTY LINE BEACH [EROSION] CONTROL STUDY
 NA - CITY OF EVANSTON ILLINOIS BEACH [EROSION] CONTROL STUDY
 NA - ATLANTIC-CITY NEW-JERSEY BEACH [EROSION] CONTROL STUDY
 NA - LAKE-ERIE SHORE LINE FROM THE MICHIGAN - OHIO STATE LINE TO MARBLEHEAD OHIO BEACH [EROSION] CONTROL STUDY
 NA - SHORE BETWEEN PEMBERTON POINT AND CAPE-COD MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
 NA - ILLINOIS SHORE OF LAKE-MICHIGAN BEACH [EROSION] CONTROL STUDY
 NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE SANDUSKY TO VERMILLION OHIO BEACH [EROSION] CONTROL STUDY
 NA - WAIKIKI-BEACH ISLAND OF OAHU T. H. BEACH [EROSION] CONTROL STUDY
 NA - REVERE-BEACH MASSACHUSETTS BEACH [EROSION] CONTROL STUDY

5210GR0001
 3705GR0001
 3801GR0001
 3801GR0002
 3701GR0001
 3701GR0001
 4006GR0001
 3801GR0003
 4300GR0001
 3507GR0001
 0000GR0009
 0000GR0006
 4010GR0001
 5604GR0001
 6910GR0001
 6209GR0004
 6204GR0003

6210GR0002
 6106GR0002
 5705GR0003
 6209GR0001
 5705GR0004
 5802GR0002
 5712GR0004
 5709GR0001
 6503GR0003
 5704GR0001
 5908GR0001
 6205GR0003
 6204GR0005
 5801GR0001
 6209GR0003
 5809GR0001
 6505GR0002
 0505GR0001
 5707GR0001
 5802GR0001
 6503GR0004
 6106GR0001
 6009GR0001
 6205GR0001
 6205GR0002

6105GR0002
 6505GR0003
 6407GR0002
 6205GR0001
 6101GR0002
 5910GR0001
 5210GR0002
 5210GR0003
 5308GR0001
 5105GR0001

EROSION

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- NA - APPENDIX XI OHIO SHORE LINE OF LAKE-ERIE EUCLID TO CHAGRIN RIVER BEACH [EROSION] CONTROL STUDY
- NA - PRESQUE-ISLE PENINSULA ERIE PENNSYLVANIA BEACH [EROSION] CONTROL STUDY
- NA - MANITOWOC COUNTY FROM TWO-RIVERS TO MANITOWOC WISCONSIN BEACH [EROSION] CONTROL STUDY
- NA - APPENDICES III VII AND XII OHIO SHORE LINE OF LAKE-ERIE BETWEEN FAIRPORT AND ASHTABULA BEACH [EROSION] CONTROL STUDY
- NA - AREA 2 HAMMONSETT RIVER TO EAST RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - PRESQUE-ISLE PENINSULA ERIE PENNSYLVANIA BEACH [EROSION] CONTROL STUDY
- NA - HAMLIN-BEACH STATE-PARK NEW-YORK BEACH [EROSION] CONTROL STUDY
- NA - SHORE OF NEW-JERSEY FROM SANDY-HOOK TO BARNEGAT INLET BEACH [EROSION] CONTROL STUDY
- NA - SELKIRK-SHORES STATE-PARK NEW-YORK BEACH [EROSION] CONTROL STUDY
- NA - AREA 7 - HOUSATONIC RIVER TO ASH CREEK CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - AREA 5 PAMCATUCK RIVER TO THAMES RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - PINELLAS COUNTY FLORIDA BEACH [EROSION] CONTROL STUDY
- NA - AREA 1 - ASH CREEK TO SAUGATUCK RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - COLONIAL-BEACH VIRGINIA BEACH [EROSION] CONTROL STUDY
- NA - FAIR-HAVEN-BEACH STATE-PARK NEW-YORK BEACH [EROSION] CONTROL STUDY
- NA - QUINCY-SHORE-BEACH MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
- NA - APPENDICES V AND X OHIO SHORE LINE OF LAKE-ERIE BETWEEN ASHTABULA AND THE PENNSYLVANIA STATE LINE BEACH [EROSION] CONTROL STUDY
- NA - GULF SHORE OF GALVESTON ISLAND TEXAS BEACH [EROSION] CONTROL STUDY
- NA - OCEANSIDE OCEAN-BEACH IMPERIAL-BEACH AND CORONADO SAN-DIEGO COUNTY CALIFORNIA BEACH [EROSION] CONTROL STUDY
- NA - APPENDIX VIII OHIO SHORE LINE OF LAKE-ERIE BETWEEN VERMILLION AND SHEFFIELD-LAKE-VILLAGE BEACH [EROSION] CONTROL STUDY
- NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE SANDUSKY BAY OHIO BEACH [EROSION] CONTROL STUDY
- NA - SANTA-BARBARA CALIFORNIA BEACH [EROSION] CONTROL STUDY
- NA - SOUTH SHORE STATE OF RHODE-ISLAND BEACH [EROSION] CONTROL STUDY
- NA - PUNTA-LAS-MARIAS SAN-JUAN P. R. BEACH [EROSION] CONTROL STUDY
- NA - AREA 9 EAST RIVER TO NEW-HAVEN HARBOR CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - CLEVELAND AND LAKEWOOD OHIO BEACH [EROSION] CONTROL STUDY
- NA - APPENDIX I COAST OF CALIFORNIA CARPENTERIA TO POINT MUGU BEACH [EROSION] CONTROL STUDY
- NA - APPENDIX II COAST OF CALIFORNIA POINT MUGU TO SAN-PEDRO BREAKWATER BEACH [EROSION] CONTROL STUDY
- NA - PLUM ISLAND MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
- NA - CITY OF KENOSHA WISCONSIN BEACH [EROSION] CONTROL STUDY
- NA - ATLANTIC-CITY NEW-JERSEY BEACH [EROSION] CONTROL STUDY
- NA - VIRGINIA-BEACH VIRGINIA BEACH [EROSION] CONTROL STUDY
- NA - FIRE-ISLAND INLET TO JONES INLET LONG-ISLAND NEW-YORK COOPERATIVE BEACH [EROSION] CONTROL STUDY
- NA - AREA 4 - CONNECTICUT RIVER TO HAMMONSETT RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - AREA 3 - NEW-HAVEN HARBOR TO HOUSATONIC RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - AREA 6 - ATLANTIC-BAY TO CONNECTICUT RIVER CONNECTICUT BEACH [EROSION] CONTROL STUDY
- NA - RACINE COUNTY WISCONSIN BEACH [EROSION] CONTROL STUDY
- NA - WAIMEA-BEACH AND HANAPEPE-BAY ISLAND OF KAUAI T. H. BEACH [EROSION] CONTROL STUDY
- NA - HAMPTON-BEACH NEW-HAMPSHIRE BEACH [EROSION] CONTROL STUDY
- NA - WINTHROP-BEACH MASSACHUSETTS
- NA - GRAND-ISLE LOUISIANA BEACH
- NA - OCEAN-CITY NEW-JERSEY BEACH
- NA - APPENDIX XIV OHIO SHORE LINE OF LAKE-ERIE SHEFFIELD-LAKE-VILLAGE TO ROCKY RIVER BEACH [EROSION] CONTROL STUDY
- NA - APPENDIX IX - SHORE OF LAKE-ERIE IN LAKE COUNTY OHIO BEACH [EROSION] CONTROL STUDY
- NA - REVERE-BEACH MASSACHUSETTS BEACH [EROSION] CONTROL STUDY
- NA - HARRISON COUNTY MISSISSIPPI BEACH [EROSION] CONTROL STUDY
- NA - BEACH [EROSION] CONTROL STUDY ST. JOHNS COUNTY FLORIDA
- NA - CERTAIN POINTS ABOUT [EROSION] COSTS AND MEASURES OF PROTECTION
- NA - COAST [EROSION] IN GREAT-BRITAIN
- NA - [EROSION] OF OUR COASTAL FRONTIERS
- NA - [EROSION] OF OUR COASTAL FRONTIERS - PART II

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| EROSION | (CONTINUED) | | |
| | INFLUENCE OF PROTECTIVE WORKS ON THE [EROSION] OF THE WEST COAST OF SYLT NORTH-SEA COAST OF GERMANY | | 0000GR0003 |
| | [EROSION] PROBLEMS ON THE OHIO SHORE OF LAKE-ERIE | | 5204GR0001 |
| | LAKE-MICHIGAN [EROSION] STUDIES | | 5300GR0001 |
| | BEACH [EROSION] STUDIES | | 3901GR0001 |
| | BEACH [EROSION] STUDIES | | 4000GR0002 |
| | BEACH [EROSION] STUDIES | | 4000GR0001 |
| | NA - JUPITER ISLAND FLORIDA BEACH [EROSION] STUDY | | 4812GR0007 |
| | NA - ANNA-MARIA AND LONGBOAT KEYS FLORIDA BEACH [EROSION] STUDY | | 4812GR0004 |
| | NA - PALM-BEACH FLORIDA BEACH [EROSION] STUDY | | 4812GR0005 |
| | NA - NORTH-CAROLINA SHORE LINE BEACH [EROSION] STUDY | | 4812GR0001 |
| | NA - NIAGARA COUNTY NEW-YORK BEACH [EROSION] STUDY | | 4308GR0001 |
| | NA - BEACH [EROSION] STUDY CORONADO CALIFORNIA | | 4202GR0001 |
| | NA - BEACH [EROSION] STUDY LAKE-ERIE SHORE LINE IN THE VICINITY OF HURON OHIO | | 4505GR0001 |
| | NA - BEACH [EROSION] STUDY LAKE-MICHIGAN SHORE LINE OF MILWAUKEE COUNTY WISCONSIN | | 4604GR0001 |
| | NA - BEACH [EROSION] STUDY OF BAKERS-HAULOVER INLET FLORIDA | | 4604GR0002 |
| | NA - BEACH [EROSION] STUDY OHIO SHORE LINE OF LAKE-ERIE FROM OHIO - MICHIGAN STATE LINE TO MARBLEHEAD OHIO | | 4505GR0002 |
| | NA - BEACH [EROSION] STUDY ORANGE COUNTY CALIFORNIA | | 4002GR0001 |
| | NA - BEACH [EROSION] STUDY ST. SIMON ISLAND GEORGIA | | 4010GR0002 |
| | DIVISION OF SHORE [EROSION] - OHIO | | 5510GR0002 |
| EUCLID | NA - APPENDIX XI OHIO SHORE LINE OF LAKE-ERIE (EUCLID) TO CHAGRIN RIVER BEACH EROSION CONTROL STUDY | | 5402GR0001 |
| EVANSTON | NA - CITY OF [EVANSTON] ILLINOIS BEACH EROSION CONTROL STUDY | | 6505GR0003 |
| EXPERIENCE | SHORE PROTECTION [EXPERIENCE] IN THE UNITED-STATES | | 6707GR0001 |
| EXPERIMENT | REVIEW OF GERMAN [EXPERIENCE] ON COASTAL PROTECTION BY GROINS | | 6307GR0002 |
| EXPERIMENTAL | [EXPERIMENT] IN SHORE PROTECTION | | 7105GR0001 |
| | (EXPERIMENTAL) GROINS CAMP-PERRY OHIO | | 5309GR0001 |
| | (EXPERIMENTAL) STEEL SHEET PILE GROINS PALM-BEACH FLORIDA | | 4800GR0001 |
| | (EXPERIMENTAL) STUDY OF THE HYDRAULIC BEHAVIOR OF INCLINED GROUYNE SYSTEMS | | 7009GR0003 |
| | (EXPERIMENTAL) STUDY OF THE HYDRAULIC BEHAVIOR OF GROUYNE SYSTEMS | | 6809GR0003 |
| | AN [EXPERIMENTAL] STUDY ON THE EFFECT OF COASTAL GROINS | | 5810GR0001 |
| FAIRFIELD | PHOTOGRAPHS OF SASCO-HILL-BEACH [FAIRFIELD] CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT | | 5705GR0002 |
| FAIRPORT | NA - APPENDIXES III VII AND XII OHIO SHORE LINE OF LAKE-ERIE BETWEEN [FAIRPORT] AND ASHTABULA BEACH EROSION CONTROL STUDY | | 5201GR0002 |
| FAIR-HAVEN-BEACH | NA - [FAIR-HAVEN-BEACH] STATE-PARK NEW-YORK BEACH EROSION CONTROL STUDY | | 5504GR0005 |
| FALMOUTH | NA - [FALMOUTH] MASSACHUSETTS | | 6407GR0003 |
| FEDERAL | PARTICIPATION OF [FEDERAL] RELIEF AGENCIES IN BEACH PROTECTION PROJECTS | | 3607GR0001 |
| FEEDER | (FEEDER) BEACHES AND GROINS RESTORE PRESQUE-ISLE PENINSULA | | 5803GR0001 |
| FEHMARN | NA - KUSTENFORSCHUNGEN IM RAUM [FEHMARN] NORDWAGRIEN | | 5700GR0009 |
| | NA - BRANDUNGSUNTERSUCHUNGEN AN DEN KUSTEN VON [FEHMARN] UND NORDWAGRIEN | | 5700GR0010 |
| FENWICK | NA - DELAWARE COAST FROM KITTS-HUMMOCK TO [FENWICK] ISLAND BEACH EROSION CONTROL STUDY | | 5707GR000C |
| FERNANDINA-BEACH | THE [FERNANDINA-BEACH] GROINS | | 5504GR0002 |
| FIELDS | COLORS SAND TESTS WITH LUMINESCENT SAND IN GROIN [FIELDS] | | 7000GR0001 |

FILL

BEHAVIOR OF BEACH (FILL) AND BORROW AREA AT PROSPECT-BEACH WEST-HAVEN CONNECTICUT
 BEHAVIOR OF BEACH (FILL) AT OCEAN-CITY NEW-JERSEY
 PHOTOGRAPHS OF CUMPO-BEACH WESTPORT CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE (FILL) PLACEMENT
 PHOTOGRAPHS OF SASCO-HILL-BEACH FAIRFIELD CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE (FILL) PLACEMENT
 FILLED EFFECT OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY (FILLED) BEACH PRESQUE-ISLE PENINSULA PENNSYLVANIA

FILLING

(FILLING) PATTERN OF THE FORT-SHERIDAN GROIN SYSTEM

FILLS

BEACH REHABILITATION BY USE OF BEACH (FILLS) AND FURTHER PLANS FOR THE PROTECTION OF THE ISLAND OF NORDERNEY
 BEHAVIOR OF BEACH (FILLS) IN NEW-ENGLAND
 BEHAVIOR OF BEACH (FILLS) IN NEW-ENGLAND

FIRE-ISLAND

NA - ATLANTIC COAST OF LONG-ISLAND (FIRE-ISLAND) INLET AND SHORE WESTERLY TO JONES INLET NEW-YORK
 NA - (FIRE-ISLAND) INLET TO JONES INLET LONG-ISLAND NEW-YORK COOPERATIVE BEACH EROSION CONTROL STUDY
 FLACHKUSTEN

FLACHKUSTEN

NA - UBER DEN EINFLUSS VON-STRANDBUHNEN AUF DIE SANDWANDERUNG AN (FLACHKUSTEN)

FLAT

NA - PROTECTION OF THE WEST BEACH OF SYLT ISLAND BY (FLAT) GROINS

FLOATING

NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF (FLOATING) ISLANDS OF THE SOUTH COAST OF GERMAN NORTH-SEA

FLOOD

NA - (FLOOD) PROTECTION AND COAST STABILIZATION

FLOOR

NA - MODEL TESTS WITH MOVEABLE (FLOOR) IN SEA AND SEA HARBOR CONSTRUCTION

FLORIDA

NA - PINELLAS COUNTY (FLORIDA)
 NA - BREVARD COUNTY (FLORIDA)
 NA - MULLET-KEY (FLORIDA)
 COASTAL PROTECTION PROCEDURES WITH SPECIAL REFERENCE TO CONDITIONS IN (FLORIDA)
 NA - BEACH EROSION CONTROL REPORT ON COOPERATIVE STUDY OF VIRGINIA AND BISCAYNE KEYS (FLORIDA)
 NA - DADE COUNTY (FLORIDA)
 COASTAL PROTECTION FOR (FLORIDA)
 NA - BEACH EROSION CONTROL STUDY ST. JOHNS COUNTY (FLORIDA)
 NA - DUVAL COUNTY (FLORIDA)
 INFORMATION ON BEACH PROTECTION IN (FLORIDA)
 DETERIORATION OF STEEL SHEET PILE GROINS AT PALM-BEACH (FLORIDA)
 REPORT ON BEACH EROSION AT HOLLYWOOD-BEACH (FLORIDA)
 NA - BEACH EROSION AT HOLLYWOOD-BEACH (FLORIDA)
 EXPERIMENTAL STEEL SHEET PILE GROINS PALM-BEACH (FLORIDA)
 NA - BEACH EROSION STUDY OF BAKERS-HAULOVER INLET (FLORIDA)
 EROSION AND PALMETTO GROINS AT NORTH POINT ST. AUGUSTINE (FLORIDA)
 SHORE EROSION AND CABBAGE PALMETTO GROINS AT NORTH POINT ST. AUGUSTINE (FLORIDA)
 RECENT STORM DAMAGE ALONG THE COASTS OF (FLORIDA) AND MISSISSIPPI
 NA - AMELIA ISLAND (FLORIDA) BEACH EROSION CONTROL STUDY
 NA - PALM-BEACH COUNTY FROM LAKE-WORTH INLET TO SOUTH-LAKE-WORTH INLET (FLORIDA) BEACH EROSION CONTROL STUDY
 NA - PINELLAS COUNTY (FLORIDA) BEACH EROSION CONTROL STUDY
 NA - JUPITER ISLAND (FLORIDA) BEACH EROSION STUDY
 NA - ANNA-MARIA AND LONGBOAT KEYS (FLORIDA) BEACH EROSION STUDY
 NA - PALM-BEACH (FLORIDA) BEACH EROSION STUDY
 (FLORIDA) COASTAL PROBLEMS
 EARLY ATTEMPTS AT INLET CONSTRUCTION ON THE (FLORIDA) EAST COAST
 NA - PALM-BEACH COUNTY (FLORIDA) FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
 PHOTOGRAPHS OF SARASOTA COUNTY (FLORIDA) SHOWING GROIN INSTALLATION

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| FLORIDA | (CONTINUED) | |
| FLOW | REVIEW OF BEACH EROSION AND STORM TIDE CONDITIONS IN (FLORIDA) 1961-1962 | 6211GR0001 |
| FLUSHING | NA - ON THE (FLOW) CHARACTERISTICS IN THE VICINITY OF GROINS | 5511GR0004 |
| FOLGERUNGEN | NA - ARTIFICIAL RESTORATION OF BEACHES WITH SPECIAL REGARD FOR BEACH (FLUSHING) NORDERNEY 1951-52 | 5700GR0014 |
| FOLLY-BEACH | NA - (FOLGERUNGEN) AUS UNTERSUCHUNGEN UBER KUSTENSCHUTZ/PROBLEME AUF SYLT | 5700GR0007 |
| FORESHORE-EROSION- | NA - BEACH EROSION AT (FOLLY-BEACH) SOUTH-CAROLINA | 3504GR0001 |
| REPORT OF THE (FORESHORE-EROSION-HUANO) | | 3612GR0001 |
| FORT-FISHER | REPORT OF THE (FORESHORE-EROSION-HUANO) | 3201GR0001 |
| FORT-MACON | NA - (FORT-FISHER) NORTH-CAROLINA | 5400GR0001 |
| FORT-SHERIDAN | PHOTOGRAPHS OF (FORT-MACON) NEAR MOREHEAD-CITY NORTH-CAROLINA AFTER SERIES OF HURRICANES IN 1954 | 6209GR0002 |
| FORT-MAUSWORTH | NA - (FORT-MACON) - ATLANTIC-BEACH AND VICINITY NORTH-CAROLINA | 5310GR0003 |
| FRANCAISE | FILLING PATTERN OF THE (FORT-SHERIDAN) GROIN SYSTEM | 6505GR0001 |
| FRANCE | NA - STATEN ISLAND (FORT-MAUSWORTH) TO ARTHUR-KILL NEW-YORK BEACH EROSION CONTROL STUDY | 5409GR0004 |
| | LES OUVRAGES DE DEFENCE CONTRE LA MER SUR LA COTE (FRANCAISE) DE LOCEAN ENTRE LA LOIRE ET LA GIRONDE | 3703GR0001 |
| | COAST PROTECTION ON THE NORTH-SEA COASTS OF HOLLAND (FRANCE) BELGIUM AND GERMANY | 5600GR0003 |
| FRIESIAN | NA - ISLAND PROTECTION ON EAST (FRIESIAN) COAST | 5900GR0002 |
| FUNCTION | NA - GROINS WITH ASPHALT GROUPE IN EAST (FRIESIAN) COAST REGION | 6107GR0001 |
| FUNCTIONS | A STUDY OF GROINS AND THEIR (FUNCTION) AS HYDRAULIC STRUCTURES | 5700GR0002 |
| FUNDAMENTALS | (FUNCTIONS) OF GROINS FUNDAMENTAL STUDY ON BEACH SEDIMENT AFFECTED BY GROINS (1) | 5409GR0001 |
| GABIONS | (FUNDAMENTALS) OF COAST EROSION AND DEFENCE | 6512GR0001 |
| | MARITIME AND RIPARIAN USE OF (GABIONS) | 3807GR0002 |
| GALVESTON | (GALVESTON) ISLAND SHORELINE AND THE PROTECTION OF GALVESTON-BEACH | 5307GR0002 |
| | NA - GULF SHORE OF (GALVESTON) ISLAND TEXAS BEACH EROSION CONTROL STUDY | 3406GR0001 |
| GALVESTON-BEACH | NA - BEACH EROSION AT (GALVESTON) TEXAS | 3807GR0002 |
| | GALVESTON ISLAND SHORELINE AND THE PROTECTION OF (GALVESTON-BEACH) | 3807GR0005 |
| GENERALITIES | PROTECTING (GALVESTON-BEACH) | 3604GR0003 |
| GEORGIA | (GALVESTON-BEACH) CONSTRUCTION | 5903GR0003 |
| GERMAN | (GENERALITIES) ON COASTAL PROCESSES AND PROTECTION | 4010GR0002 |
| | NA - BEACH EROSION STUDY ST. SIMON ISLAND (GEORGIA) | 5700GR0004 |
| GERMANY | REVIEW OF (GERMAN) EXPERIENCE ON COASTAL PROTECTION BY GROINS | 0000GR0003 |
| | NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF FLOATING ISLANDS OF THE SOUTH COAST OF (GERMAN) NORTH-SEA | 3703GR0001 |
| GRAND-ISLE | INFLUENCE OF PROTECTIVE WORKS ON THE EROSION OF THE WEST COAST OF SYLT NORTH-SEA COAST OF (GERMANY) | 5604GR0001 |
| | COAST PROTECTION ON THE NORTH-SEA COASTS OF HOLLAND FRANCE BELGIUM AND (GERMANY) | |
| | BEACH EROSION CONTROL (GRAND-ISLE) LOUISIANA | |
| | NA - (GRAND-ISLE) LOUISIANA BEACH EROSION CONTROL STUDY | |

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| GREAT-BRITAIN | COAST EROSION IN [GREAT-BRITAIN] | 4204GR0001 |
| GREAT-LAKES | <p>GROINS ON THE SHORE OF THE [GREAT-LAKES]</p> <p>GROINS ON THE SHORES OF THE [GREAT-LAKES]</p> <p>LOW COST SHORE PROTECTION USED ON THE [GREAT-LAKES]</p> <p>PRINCIPLES OF SHORE PROTECTION FOR THE [GREAT-LAKES]</p> | 6105GR0001 6111GR0001 5310GR0001 5310GR0002 |
| GROUT | NA - GROINS WITH ASPHALT [GROUT] IN EAST FRIESIAN COAST REGION | 5900GR0002 |
| GUIDE | MAN AGAINST THE SEA A [GUIDE] TO EROSION CONTROL | 0000GR0009 |
| GULF | NA - [GULF] SHORE OF GALVESTON ISLAND TEXAS BEACH EROSION CONTROL STUDY | 5307GR0002 |
| HALEIWA-BEACH | NA - [HALEIWA-BEACH] OAHU HAWAII BEACH EROSION CONTROL STUDY | 6503GR0004 |
| HAMLIN-BEACH | NA - [HAMLIN-BEACH] STATE-PARK NEW-YORK BEACH EROSION CONTROL STUDY | 5504GR0006 |
| HAMMONASSET | NA - AREA 4 - CONNECTICUT RIVER TO [HAMMONASSET] RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5206GR0001 |
| HAMPTON-BEACH | NA - AREA 2 - [HAMMONASSET] RIVER TO EAST RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5002GR0001 |
| HAMPTON-BEACH | NA - [HAMPTON-BEACH] NEW-HAMPSHIRE BEACH EROSION CONTROL STUDY | 5402GR0002 |
| HANAPEPE-BAY | NA - WAIKEA-BEACH AND [HANAPEPE-BAY] ISLAND OF KAUAI I. A. BEACH EROSION CONTROL STUDY | 5606GR0001 |
| HARBOR | <p>SOME ASPECTS OF SHORE PROTECTION IN BOSTON [HARBOR]</p> <p>NA - ANAHEIM-BAY [HARBOR] CALIFORNIA</p> <p>NA - AREA 9 EAST RIVER TO NEW-HAVEN [HARBOR] CONNECTICUT BEACH EROSION CONTROL STUDY</p> <p>NA - MODEL TESTS WITH MOVEABLE FLOOR IN SEA AND SEA [HARBOR] CONSTRUCTION</p> <p>NA - MODEL INVESTIGATIONS OF [HARBOR] INLET SILTING</p> <p>NA - HELLGAND HISTORY OF ITS ORIGIN AND MAINTENANCE OF ITS [HARBOR] RELATIVE TO NAVIGATION</p> <p>NA - AREA 3 - NEW-HAVEN [HARBOR] TO HOUSATONIC RIVER CONNECTICUT BEACH EROSION CONTROL STUDY</p> <p>NA - COLD-SPRING INLET (CAPE-MAY [HARBOR]) NEW-JERSEY</p> | 5210GR0004 5403GR0001 5605GR0002 5400GR0002 5900GR0001 5500GR0009 5306GR0002 5307GR0001 |
| HARBORS | LITTORAL DRIFT PROBLEM AT SHORE-LINE [HARBORS] | 5900GR0003 |
| | NA - SUITABILITY OF MODEL TESTS IN MARITIME ENGINEERING IN [HARBORS] SEAWAYS AND COASTAL PROTECTION | 5600GR0006 |
| HARKYSTER | NA - MATERIALVANDRING PA [HARKYSTER] | 5306GR0005 |
| HARRISON | NA - [HARRISON] COUNTY MISSISSIPPI BEACH EROSION CONTROL STUDY | 4805GR0001 |
| HAWAII | NA - HALEIWA-BEACH OAHU [HAWAII] BEACH EROSION CONTROL STUDY | 6503GR0004 |
| | NA - WAIKIKI-BEACH OAHU [HAWAII] BEACH EROSION CONTROL STUDY | 6503GR0003 |
| HAWKS-NEST-BEACH | [HAWKS-NEST-BEACH] CONNECTICUT | 4001GR0003 |
| HEADLANDS | USE OF LONG GROINS AS ARTIFICIAL [HEADLANDS] | 6510GR0002 |
| | THE RELATION OF THE ACTION OF WAVES AND CURRENTS ON [HEADLANDS] TO THE CONTROL OF SHORE EROSION BY GROINS | 4300GR0001 |
| HELLGAND | NA - [HELLGAND] HISTORY OF ITS ORIGIN AND MAINTENANCE OF ITS HARBOR RELATIVE TO NAVIGATION | 5500GR0009 |
| HIDDENSEE | NA - COASTAL CHANGES AND COASTAL PROTECTION OF THE ISLAND [HIDDENSEE] | 5600GR0007 |
| HISTORY | <p>NA - HELGOLAND [HISTORY] OF ITS ORIGIN AND MAINTENANCE OF ITS HARBOR RELATIVE TO NAVIGATION</p> <p>A PICTORIAL [HISTORY] OF SELECTED STRUCTURES ALONG THE NEW-JERSEY COAST</p> <p>CASE [HISTORY] OF SHORE PROTECTION AT PRESQUE-ISLE PENNSYLVANIA</p> <p>THE [HISTORY] OF THE DUTCH COAST IN THE LAST CENTURY</p> | 5500GR0009 6410GR0001 5210GR0003 7009GR0001 |

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| HOLLAND | COAST PROTECTION ON THE NORTH-SEA COASTS OF [HOLLAND] FRANCE BELGIUM AND GERMANY | 3703GR0001 |
| | NA - REPORT ON THE USE OF ASPHALT AT GROIN CONSTRUCTION IN DELFTLAND ([HOLLAND]) | 4600GR0001 |
| HOLLYWOOD-BEACH | | 3705GR0001 |
| | NA - BEACH EROSION AT [HOLLYWOOD-BEACH] FLORIDA | 3801GR0001 |
| | REPORT ON BEACH EROSION AT [HOLLYWOOD-BEACH] FLORIDA | 6511GR0001 |
| HOMER | STUDY OF EROSION ALONG [HOMER] SPIT AND VICINITY KACHEMAK-BAY ALASKA | 0000GR0006 |
| HORIZONTAL | THE BUDD (HORIZONTALLY) PERMEABLE GROIN SYSTEM FOR BEACH EROSION CONTROL AND REBUILDING SAND BEACHES | 5306GR0002 |
| HOUSTONIC | | 5310GR0004 |
| | NA - AREA 3 - NEW-HAVEN HARBOR TO [HOUSTONIC] RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5709GR0001 |
| | NA - AREA 7 - [HOUSTONIC] RIVER TO ASH CREEK CONNECTICUT BEACH EROSION CONTROL STUDY | 6407GR0001 |
| HUMBOLDT-BAY | | 4505GR0001 |
| | NA - APPENDIX VI [HUMBOLDT-BAY] (BUREAU POINT) CALIFORNIA BEACH EROSION CONTROL STUDY | 5400GR0001 |
| HUNTING-ISLAND-SEA | | 6809GR0003 |
| | NA - [HUNTING-ISLAND-SEA] SOUTH-CAROLINA | 7009GR0003 |
| HURON | NA - BEACH EROSION STUDY LAKE-ERIE SHORE LINE IN THE VICINITY OF [HURON] OHIO | 5101GR0001 |
| HURRICANES | | 6107GR0001 |
| | PHOTOGRAPHS OF FORT-MACON NEAR MOREHEAD-CITY NORTH-CAROLINA AFTER SERIES OF [HURRICANES] IN 1954 | 5300GR0004 |
| HYDRAULIC | | 5600GR0001 |
| | EXPERIMENTAL STUDY OF THE [HYDRAULIC] BEHAVIOR OF GROINE SYSTEMS | 6505GR0003 |
| | EXPERIMENTAL STUDY OF THE [HYDRAULIC] BEHAVIOR OF INCLINED GROINE SYSTEMS | 6500GR0002 |
| | APPLICATION OF ASPHALT IN [HYDRAULIC] ENGINEERING WORKS | 5210GR0006 |
| | A STUDY OF GROINS AND THEIR FUNCTION AS [HYDRAULIC] STRUCTURES | 6112GR0002 |
| | NA - [HYDRAULIC] STRUCTURES (GROINS DAMS DYKES AND CANAL EMBANKMENTS) OF BITUMEN TYPE | 5605GR0001 |
| IDEAS | NA - SOME [IDEAS] ON THE PROBLEM OF RESEARCH IN COASTAL DYNAMICS AND MODEL TESTS OF COASTAL PROTECTION | 5700GR0001 |
| ILLINOIS | | 5810GR0002 |
| | NA - CITY OF EVANSTON [ILLINOIS] BEACH EROSION CONTROL STUDY | 2300GR0001 |
| | PERMEABLE GROINS FROM [ILLINOIS] ON LAKE-MICHIGAN | 0306GR0001 |
| | NA - [ILLINOIS] SHORE OF LAKE-MICHIGAN BEACH EROSION CONTROL STUDY | 7009GR0003 |
| IMAZU-SAKANU-BEACH | | 0000GR0008 |
| | BEACH EROSION AND PROTECTION WORKS IN [IMAZU-SAKANU-BEACH] | 0000GR0002 |
| IMPERIAL-BEACH | | 5101GR0002 |
| | NA - OCEANSIDE OCEAN-BEACH [IMPERIAL-BEACH] AND CORONADO SAN-DIEGO COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY | 0000GR0003 |
| IMPERMEABLE | (IMPERMEABLE) AND PERMEABLE GROINS | 5210GR0008 |
| IMPORTANCE | SUMMARY STATEMENT CONCERNING [IMPORTANCE] OF A GROIN DESIGN CRITERION | |
| IMPROVEMENT | CONEY ISLAND PUBLIC BEACH AND BOARDWALK [IMPROVEMENT] | |
| | THE PROTECTION AND [IMPROVEMENT] OF FRESHWATERS BY THE UTILIZATION OF TIDAL AND WAVE ACTION | |
| INCLINED | EXPERIMENTAL STUDY OF THE HYDRAULIC BEHAVIOR OF [INCLINED] GROINE SYSTEMS | |
| INCREASING | THE PRINCIPLE OF [INCREASING] PERMEABILITY IN GROIN CONSTRUCTION | |
| INFLUENCE | THE COASTAL DYNAMICS OF SAND WAVES AND THE [INFLUENCE] OF BREAKWATERS AND GROYNES | |
| | [INFLUENCE] OF GROINS ON BEACH STABILIZATION | |
| | [INFLUENCE] OF PROTECTIVE WORKS ON THE EROSION OF THE WEST COAST OF SVLT NORTH-SEA COAST OF GERMANY | |
| INFORMATION | [INFORMATION] ON BEACH PROTECTION IN FLORIDA | |

INITIAL
LABORATORY STUDY OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL TRANSPORT EQUIPMENT DEVELOPMENT AND [INITIAL]
TESTS

INLET

NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH [INLET] AND FROM SOUTH-LAKE-WORTH INLET TO
BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
NA - ATLANTIC COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY INLET TO ROCKAWAY [INLET] AND JAMAICA-BAY NEW-YORK
6506GR0001
6503GR0002
5802GR0002
5603GR0001
3807GR0001
4604GR0002
5712GR0004
5605GR0003
3801GR0002
3701GR0001
6503GR0002
5900GR0001
6105GR0002
5908GR0001
5605GR0003
6506GR0001
5712GR0004
5307GR0001
3512GR0001
5200GR0006
5200GR0005
6200GR0001
5300GR0002
2806GR0001
5607GR0001
6206GR0002
0000GR0007
6900GR0001
6900GR0004
6900GR0003
6500GR0004
5300GR0003
4900GR0007
4900GR0006
4900GR0002
4900GR0001
4900GR0003
4900GR0004
3100GR0002
3100GR0001
4900GR0005

NA - BEACH EROSION STUDY OF RAKEPS-HAULOVER INLET, FLORIDA
NA - PALM-BEACH COUNTY FROM LAKE-WORTH INLET TO SOUTH-LAKE-WORTH [INLET] FLORIDA BEACH EROSION CONTROL STUDY
NA - FIRE-ISLAND INLET TO JONES [INLET] LONG-ISLAND NEW-YORK COOPERATIVE BEACH EROSION CONTROL STUDY
REPORT ON EROSION AT MANASQUAN [INLET] NEW-JERSEY AND ADJACENT BEACHES
NA - BEACH EROSION AT LONG-ISLAND FIRE-ISLAND INLET AND SHORE WESTERLY TO JONES [INLET] NEW-YORK
NA - MODEL INVESTIGATIONS OF HARBOR [INLET] SILTING
NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH [INLET] TO
BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
NA - SHORE OF NEW-JERSEY - BARNEGAT [INLET] TO CAPE-MAY-CANAL BEACH EROSION CONTROL STUDY
NA - FIRE-ISLAND [INLET] TO JONES INLET LONG-ISLAND NEW-YORK COOPERATIVE BEACH EROSION CONTROL STUDY
NA - ATLANTIC COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY [INLET] TO ROCKAWAY INLET AND JAMAICA-BAY NEW-YORK
NA - PALM-BEACH COUNTY FROM LAKE-WORTH [INLET] TO SOUTH-LAKE-WORTH INLET FLORIDA BEACH EROSION CONTROL STUDY
NA - COLD-SPRING [INLET] (CAPE-MAY HARBOR) NEW-JERSEY

INSEL

DIE SCHUTZHAUTEN AUF DER [INSEL] BORKUM
NA - GUTACHTLICHE STELLUNGNAHME ZU DEN UNTERSUCHUNGEN UBER DIE URSACHEN DER ABRUCHSERSCHINUNGEN AM WEST UND
NORD-WESTSTRAND DER [INSEL] NORDERNEY
NA - DIE URSACHEN DER ABRUCHSERSCHINUNGEN AN WEST UND NORDWESTSTRAND DER [INSEL] NORDERNEY

INSTALLATION

PHOTOGRAPHS OF SARASOTA COUNTY FLORIDA SHOWING GROIN [INSTALLATION]
NA - THEORETICAL OBSERVATIONS FOR [INSTALLATION] OF COASTAL PROTECTIVE STRUCTURES ON TIDELESS SHORES
TEST WITH SCALE MODELS TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE ADVANTAGEOUS
[INSTALLATION] OF GROINSPUR OF GROINS

INTERIM

[INTERIM] REPORT ON ASPHALT GROINS AT OCEAN-CITY MARYLAND
NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL [INTERIM] REPORT ON THE VENTURA AREA COOPERATIVE BEACH EROSION
CONTROL STUDY

INTERNAL

NA - ON THE LENGTH AND THE [INTERNAL] STRUCTURE OF SEASHORE GROINS

INTERNATIONAL

REPORT TO THE 22ND [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 22ND [INTERNATIONAL] NAVIGATION CONGRESS
NA - REPORT TO THE 22ND [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 21ST [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 18TH [INTERNATIONAL] NAVIGATION CONGRESS
NA - REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
NA - REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
NA - REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 15TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 15TH [INTERNATIONAL] NAVIGATION CONGRESS
REPORT TO THE 17TH [INTERNATIONAL] NAVIGATION CONGRESS

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| INVESTIGATION | 36006GR0001 |
| NA - AN [INVESTIGATION] INTO THE EFFECTIVENESS OF VARIOUS TYPES OF GROYNES ON SEAFORD-BEACH | |
| INVESTIGATIONS | 66006GR0001 |
| SEA GROINS EFFECTIVENESS [INVESTIGATIONS] BY DYED SAND TESTS | |
| NA - MODEL [INVESTIGATIONS] OF HARBOR INLET SILTING | 59006GR0001 |
| [INVESTIGATIONS] OF STEEL SHEET PILING | 36076GR0002 |
| IN-SITU | |
| MODEL STUDIES [IN-SITU] OBSERVATIONS | 70006GR0003 |
| ISLAND | |
| NA - PROBLEMS OF [ISLAND] AND COAST PROTECTION | 45006GR0001 |
| NA - DELAWARE COAST FROM KITS-HUMMOCK TO FENWICK [ISLAND] BEACH EROSION CONTROL STUDY | 57076GR0001 |
| NA - PROTECTION OF THE WEST BEACH OF SYLT [ISLAND] BY FLAT GROINS | 60006GR0002 |
| NA - AMELIA [ISLAND] FLORIDA BEACH EROSION CONTROL STUDY | 61066GR0002 |
| NA - JUPITER [ISLAND] FLORIDA BEACH EROSION STUDY | 48126GR0007 |
| NA - STATION [ISLAND] FORT-WADSWORTH TO ARTHUR-KILL NEW-YORK BEACH EROSION CONTROL STUDY | 65056GR0001 |
| NA - BEACH EROSION STUDY ST-SIMON [ISLAND] GEORGIA | 40106GR0002 |
| NA - COASTAL CHANGES AND COASTAL PROTECTION OF THE [ISLAND] HUIDENSEE | 56006GR0007 |
| NA - AERIAL PHOTOGRAPHS PLUM [ISLAND] MASSACHUSETTS | 62086GR0001 |
| NA - PLUM [ISLAND] MASSACHUSETTS BEACH EROSION CONTROL STUDY | 53086GR0002 |
| NA - OCAUCUE [ISLAND] NORTH-CAROLINA | 65036GR0001 |
| NA - CONSTRUCTION OF A HEAVY DUNE COVER BY ASPHALT HASALT METHOD ON THE [ISLAND] OF BOHKUM | 57006GR0005 |
| NA - WAINEA-BEACH AND HANAPEPE-BAY [ISLAND] OF KAUAI T. H. BEACH EROSION CONTROL STUDY | 56066GR0001 |
| BEACH REHABILITATION BY USE OF BEACH FILLS AND FURTHER PLANS FOR THE PROTECTION OF THE [ISLAND] OF NORDERNEY | 60086GR0005 |
| NA - WAIKIKI-BEACH [ISLAND] OF OAHU T. H. BEACH EROSION CONTROL STUDY | 53086GR0001 |
| NA - [ISLAND] PROTECTION ON EAST FRIESTIAN COAST | 50006GR0003 |
| NA - THE EFFECT OF [ISLAND] PROTECTIVE STRUCTURES ON BEACH DEVELOPMENT IN WEST PART OF NORDERNEY | 55006GR0008 |
| NA - ORIGIN AND DEVELOPMENT OF [ISLAND] PROTECTIVE WORKS ON NORDERNEY | 55006GR0006 |
| CONEY [ISLAND] PUBLIC BEACH AND BUAHAWALK IMPROVEMENT | 23006GR0001 |
| GALVESTON [ISLAND] SHORELINE AND THE PROTECTION OF GALVESTON-BEACH | 38076GR0002 |
| REPORT ON ST-SIMON [ISLAND] STUDIES | 41016GR0001 |
| NA - GULF SHORE OF GALVESTON [ISLAND] TEXAS BEACH EROSION CONTROL STUDY | 53076GR0002 |
| NA - ORIGIN AND DECLINE OF THE [ISLAND] TRISCHEN | 50006GR0002 |
| ISLANDS | |
| NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF FLOATING [ISLANDS] OF THE SOUTH COAST OF GERMAN NORTH-SEA | 57006GR0004 |
| ISLE | |
| NA - A MATHEMATICAL THEORY ABOUT SAND WAVES AND ITS APPLICATION ON THE DUTCH WADDEN [ISLE] OF VLIELAND | 68106GR0001 |
| ISRAEL | |
| NEW COASTAL WORKS AT NAHARIYA ([ISRAEL]) | 65026GR0001 |
| JACOB-RIIS | |
| [JACOB-RIIS] PARK | |
| NA - BEACH EROSION AT [JACOB-RIIS] PARK LONG-ISLAND NEW-YORK | 36046GR0002 |
| JAMAICA-BAY | 36016GR0002 |
| NA - ATLANTIC COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY INLET TO ROCKAWAY INLET AND [JAMAICA-BAY] NEW-YORK | 65066GR0001 |
| JETTIES | |
| MEASURES AGAINST EROSION AT GROINS AND [JETTIES] | 52106GR0001 |
| ASPHALT GROINS AND [JETTIES] | 55116GR0002 |
| MESH [JETTIES] | 36026GR0001 |
| PERMEABLE [JETTIES] BUILT TO PROTECT CLEVELANDS SHORE | 45076GR0001 |
| PIERS AND [JETTIES] OF PRECAST CONCRETE | 46026GR0002 |
| CURVED [JETTIES] SEA-WALLS BULKHEADS AND RETAINING WALLS | 40016GR0002 |
| JETTY | |
| BETTER [JETTY] FOR LESS MONEY | 59036GR0001 |
| JONES | |
| NA - FIRE-ISLAND INLET TO [JONES] INLET LONG-ISLAND NEW-YORK COOPERATIVE BEACH EROSION CONTROL STUDY | 56056GR0003 |
| NA - ATLANTIC COAST OF LONG-ISLAND FIRE-ISLAND INLET AND SHORE WESTERLY TO [JONES] INLET NEW-YORK | 65036GR0002 |
| JUPITER | |
| NA - [JUPITER] ISLAND FLORIDA BEACH EROSION STUDY | 48126GR0007 |

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| KACHEMAK-BAY STUDY OF EROSION ALONG HOMER SPIT AND VICINITY [KACHEMAK-BAY] ALASKA | 6511GR0001 |
| KAUAI NA - WAIMEA-BEACH AND HANAPEPE-BAY ISLAND OF [KAUAI] I. H. BEACH EROSION CONTROL STUDY | 5606GR0001 |
| KENOSHA PERMEABLE GROINS AT [KENOSHA] WISCONSIN NA - CITY OF [KENOSHA] WISCONSIN BEACH EROSION CONTROL STUDY | 4001GR0001 5509GR0002 |
| KEYS NA - BEACH EROSION CONTROL REPORT ON COOPERATIVE STUDY OF VIRGINIA AND BISCAYNE [KEYS] FLORIDA | 6209GR0004 |
| KITTS-HUMMOCK NA - ANNA-MARIA AND LONGBOAT [KEYS] FLORIDA BEACH EROSION STUDY | 4812GR0004 |
| KUSTENAUSSCHUSSES NA - DELAWARE COAST FROM [KITTS-HUMMOCK] TO FENWICK ISLAND BEACH EROSION CONTROL STUDY | 5707GR0001 |
| KUSTENFORSCHUNGEN NA - AUS DEN ARBEITEN DES [KUSTENAUSSCHUSSES] OST | 5600GR0004 |
| KUSTENSCHUTZ NA - [KUSTENFORSCHUNGEN] IM RAUM FERMARN NORDWAGRIEN | 5700GR0009 |
| NA - ALLGEMEINE EMPFEHLUNGEN FUR DEN DEUTSCHEN [KUSTENSCHUTZ] NA - HUNDERT JAHRE [KUSTENSCHUTZ] AN DER NORDSEE NA - UFERVERANDERUNGEN UND [KUSTENSCHUTZ] AUF SYLT | 5500GR0002 5500GR0003 5700GR0006 |
| KUSTENSCHUTZPROBLE NA - FOLGERUNGEN AUS UNTERSUCHUNGEN UBER [KUSTENSCHUTZPROBLEME] AUF SYLT | 5700GR0007 |
| LABORATORY [LABORATORY] STUDY OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL TRANSPORT EQUIPMENT DEVELOPMENT AND INITIAL TESTS | 5906GR0001 |
| LAKE NA - APPENDIX IX - SHORE OF LAKE-ERIE IN [LAKE] COUNTY OHIO BEACH EROSION CONTROL STUDY | 5005GR0001 |
| LAKE#000 SHOREWOOD PROTECTS ITS [LAKE] FRONT | 3807GR0004 |
| LAKE-ERIE NA - CLEVELAND AND [LAKE#000] OHIO BEACH EROSION CONTROL STUDY | 5003GR0002 |
| PERMEABLE AND SEMIPERMEABLE GROINS FROM OHIO ON [LAKE-ERIE] EFFECTS OF LARGE STRUCTURES ON THE OHIO SHORE OF [LAKE-ERIE] EROSION PROBLEMS ON THE OHIO SHORE OF [LAKE-ERIE] NA - APPENDICES V AND X OHIO SHORE LINE OF [LAKE-ERIE] BETWEEN ASHTABULA AND THE PENNSYLVANIA STATE LINE BEACH EROSION CONTROL STUDY | 6500GR0003 6400GR0002 5204GR0001 |
| NA - APPENDICES III VII AND XII OHIO SHORE LINE OF [LAKE-ERIE] BETWEEN FAIRPORT AND ASHTABULA BEACH EROSION CONTROL STUDY | 5201GR0003 |
| NA - APPENDIX VIII OHIO SHORE LINE OF [LAKE-ERIE] BETWEEN VERMILLION AND SHEFFIELD-LAKE-VILLAGE BEACH EROSION CONTROL STUDY | 5201GR0002 |
| NA - APPENDIX XI OHIO SHORE LINE OF [LAKE-ERIE] EUCLID TO CHAGRIN RIVER BEACH EROSION CONTROL STUDY | 5308GR0003 |
| NA - BEACH EROSION STUDY OHIO SHORE LINE OF [LAKE-ERIE] FROM OHIO - MICHIGAN STATE LINE TO MARBLEHEAD OHIO | 5402GR0001 |
| NA - APPENDIX IX - SHORE OF [LAKE-ERIE] IN LAKE COUNTY OHIO BEACH EROSION CONTROL STUDY | 4505GR0002 |
| NA - APPENDIX IV OHIO SHORE LINE OF [LAKE-ERIE] SANDUSKY MAY OHIO BEACH EROSION CONTROL STUDY | 5005GR0001 |
| NA - APPENDIX IV OHIO SHORE LINE OF [LAKE-ERIE] SANDUSKY TO VERMILLION OHIO BEACH EROSION CONTROL STUDY | 5304GR0002 |
| NA - APPENDIX XIV OHIO SHORE LINE OF [LAKE-ERIE] SHEFFIELD-LAKE-VILLAGE TO ROCKY RIVER BEACH EROSION CONTROL STUDY | 5212GR0002 |
| NA - [LAKE-ERIE] SHORE LINE FROM THE MICHIGAN - OHIO STATE LINE TO MARBLEHEAD OHIO BEACH EROSION CONTROL STUDY | 5304GR0003 |
| NA - BEACH EROSION STUDY [LAKE-ERIE] SHORE LINE IN THE VICINITY OF HURON OHIO | 6101GR0002 4505GR0001 |
| LAKE-MICHIGAN PERMEABLE GROINS FROM ILLINOIS ON [LAKE-MICHIGAN] GROINS FROM WISCONSIN ON [LAKE-MICHIGAN] EFFECTIVENESS OF PERMEABLE TYPE GROINS USED FOR BEACH PROTECTION AT SHOREWOOD WISCONSIN AND OTHER CITIES ALONG THE WEST SHORE OF [LAKE-MICHIGAN] THE NORTH SHORE VERSUS [LAKE-MICHIGAN] NA - ILLINOIS SHORE OF [LAKE-MICHIGAN] BEACH EROSION CONTROL STUDY [LAKE-MICHIGAN] EROSION STUDIES | 6500GR0002 6500GR0001 3911GR0001 3011GR0001 5210GR0006 5300GR0001 |

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| LAKE-MICHIGAN (CONTINUED) | 4604GR0001 |
| NA - BEACH EROSION STUDY (LAKE-MICHIGAN) SHORE LINE OF MILWAUKEE COUNTY WISCONSIN | |
| LAKE-WORTH | 6105GR0002 |
| NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO (LAKE-WORTH) INLET AND FROM SOUTH-LAKE-WORTH INLET TO GROWARD COUNTY LINE BEACH EROSION CONTROL STUDY | 5712GR0004 |
| NA - PALM-BEACH COUNTY FROM (LAKE-WORTH) INLET TO SOUTH-LAKE-WORTH INLET FLORIDA BEACH EROSION CONTROL STUDY | |
| LARGE EFFECTS OF (LARGE) STRUCTURES ON THE OHIO SHORE OF LAKE-ERIE | 6400GR0002 |
| LARVOTTO-BAY | 6809GR0004 |
| THE CREATION OF AN ARTIFICIAL BEACH IN (LARVOTTO-BAY) MONTE-CARLO PRINCIPALITY OF MONACO | |
| LEE-EROSION | 0000GR0004 |
| NA - MODEL TESTS OF BEACH BREAK AT THE END OF STABILIZED COASTAL BEACHES (LEE-EROSION) | |
| LENGTH | 0000GR0007 |
| NA - ON THE (LENGTH) AND THE INTERNAL STRUCTURE OF SEASHORE GROINS | |
| LEROSION | 6410GR0002 |
| NA - PROTECTION DES COTES CONTRE (LEROSION) MARITIME ET FORMATION DES PLAGES DE SABLE | |
| LESS BETTER JETTY FOR (LESS) MONEY | 5903GR0001 |
| LIABILITIES | 6510GR0003 |
| GROINS AND EFFECTS - MINIMIZING (LIABILITIES) | |
| LIFE (LIFE) OF STEEL SHEET PILE STRUCTURES IN ATLANTIC COASTAL STATES | 5210GR0002 |
| LIMIT PAPER ON PROTECTIVE WORKS ADAPTED TO (LIMIT) EROSION ALONG THE OPEN COAST HOW THEY WORK | 4806GR0001 |
| LIMITS | 5700GR0013 |
| NA - POSSIBILITIES AND (LIMITS) FOR APPLICATION OF ASPHALT TYPES OF CONSTRUCTIONS FOR COASTAL PROTECTION | |
| LITTORAL | 5900GR0003 |
| (LITTORAL) DRIFT PROBLEM AT SHORE-LINE HARBOURS | |
| THE DANISH WESTCOAST - (LITTORAL) DRIFT PROBLEMS AND MEASURES AGAINST COAST EROSION | 5008GR0001 |
| (LITTORAL) PROCESSES AND THE DEVELOPMENT OF SHORELINES | 6510GR0004 |
| (LITTORAL) PROCESSES ON SANDY COASTS | 5010GR0002 |
| SCALE EFFECTS IN MODELS WITH (LITTORAL) SAND DRIFT | 6008GR0001 |
| LABORATORY STUDY OF THE EFFECT OF GROINS ON THE RATE OF (LITTORAL) TRANSPORT EQUIPMENT DEVELOPMENT AND INITIAL TESTS | 5906GR0001 |
| LOIRE | 5409GR0004 |
| LES OUVRAGES DE DEFENCE CONTRE LA MER SUR LA COTE FRANCAISE DE LOCEAN ENTRE LA (LOIRE) ET LA GIRONDE | |
| LONG | 6510GR0002 |
| USE OF (LONG) GROINS AS ARTIFICIAL HEADLANDS | |
| LONGBOAT | 4812GR0004 |
| NA - ANNA-MARIA AND (LONGBOAT) KEYS FLORIDA BEACH EROSION STUDY | |
| LONGITUDINAL | 5511GR0003 |
| THE (LONGITUDINAL) STABILITY OF BEACHES | |
| NA - UNDERWATER (LONGITUDINAL) WORKS FOR COASTAL PROTECTION | 5200GR0001 |
| LONG-ISLAND | |
| THE ATLANTIC COAST OF (LONG-ISLAND) | |
| COAST EROSION AND PROTECTION ON (LONG-ISLAND) AND NEW-JERSEY | 6809GR0007 |
| NA - ATLANTIC COAST OF (LONG-ISLAND) FIRE-ISLAND INLET AND SHORE WESTERLY TO JONES INLET NEW-YORK | 1508GR0001 |
| EFFECTIVENESS OF GROINS AT ROCKAWAY-BEACH (LONG-ISLAND) NEW-YORK | 6503GR0002 |
| NA - BEACH EROSION AT JACOB-RIS PARK (LONG-ISLAND) NEW-YORK | 3812GR0001 |
| NA - FIRE-ISLAND INLET TO JONES INLET (LONG-ISLAND) NEW-YORK COOPERATIVE BEACH EROSION CONTROL STUDY | 3601GR0002 |
| BEACH BEHAVIOR NORTH SHORE (LONG-ISLAND) SOUND | 5605GR0003 |
| LOS-ANGELES | 7011GR0001 |
| REPORT OF ADVISORY-BOARD ON BEACH PROTECTION (LOS-ANGELES) COUNTY | |
| LOUISIANA | 3012GR0001 |
| BEACH EROSION CONTROL GRAND-ISLE (LOUISIANA) | |
| NA - BELLE-PASS TO RACCOON POINT (LOUISIANA) BEACH EROSION CONTROL STUDY | 5604GR0001 |
| NA - GRAND-ISLE (LOUISIANA) BEACH EROSION CONTROL STUDY | 6202GR0001 |
| | 5504GR0004 |

LOW-COST
CONCRETE BLOCKS FORM (LOW-COST) GROINS
LUMINESCENT
COLORED SAND TESTS WITH (LUMINESCENT) SAND IN GROIN FIELDS
MAINTENANCE
NA - PROVISIONS FOR STABILIZATION AND (MAINTENANCE) OF FLOATING ISLANDS OF THE SOUTH COAST OF GERMAN NORTH-SEA
NA - HELGOLAND HISTORY OF ITS ORIGIN AND (MAINTENANCE) OF ITS HARBOR RELATIVE TO NAVIGATION
CONSTRUCTION AND (MAINTENANCE) OF THE PUBLIC BEACH AT HOCKMAY-BEACH BOROUGH OF QUEENS
MANASQUAN
NA - BEACH EROSION AT (MANASQUAN) INLET NEW-JERSEY AND ADJACENT BEACHES
REPORT ON EROSION AT (MANASQUAN) INLET NEW-JERSEY AND ADJACENT BEACHES
MANITOWOC
NA - (MANITOWOC) COUNTY FROM TWO-RIVERS TO MANITOWOC WISCONSIN BEACH EROSION CONTROL STUDY
NA - MANITOWOC COUNTY FROM TWO-RIVERS TO (MANITOWOC) WISCONSIN BEACH EROSION CONTROL STUDY
MANUAL
NA - (MANUAL) OF WATER ECONOMY
MARBLEHEAD
NA - BEACH EROSION STUDY OHIO SHORE LINE OF LAKE-ERIE FROM OHIO - MICHIGAN STATE LINE TO (MARBLEHEAD) OHIO
NA - LAKE-ERIE SHORE LINE FROM THE MICHIGAN - OHIO STATE LINE TO (MARBLEHEAD) OHIO BEACH EROSION CONTROL STUDY
MARITIMA
NA - PROTECCAO DA COSTA CONTRA A EROSAO (MARITIMA) E FORMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA COSTA DE
MOCAMBIQUE
MARITIME
(MARITIME) AND RIPARIAN USE OF GRABIONS
NA - SUITABILITY OF MODEL TESTS IN (MARITIME) ENGINEERING IN HARBORS SEAWAYS AND COASTAL PROTECTION
NA - PROTECTION DES COTES CONTRE LE ROSION (MARITIME) ET FORMATION DES PLAGES DE SABLE
WINDS WAVES AND (MARITIME) STRUCTURES
MARTIN
NA - PALM-BEACH COUNTY FLORIDA FROM (MARTIN) COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO
BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
MARYLAND
BEHAVIOR OF SAND ASPHALT GROINS AT OCEAN-CITY (MARYLAND)
INTERIM REPORT ON ASPHALT GROINS AT OCEAN-CITY (MARYLAND)
THE ASPHALT GROINS AT OCEAN-CITY (MARYLAND)
REPORT ON SHORE EROSION AT TILGHMAN POINT (MARYLAND)
MARYLANDS
(MARYLANDS) FAVORITE BEACH AT OCEAN-CITY
MASSACHUSETTS
NA - FALMOUTH (MASSACHUSETTS)
AERIAL PHOTOGRAPHS PLUM ISLAND (MASSACHUSETTS)
NA - WESSAGUSSETT-BEACH WEYMOUTH (MASSACHUSETTS)
COASTAL PROTECTION IN (MASSACHUSETTS)
SHORE PROTECTIVE WORK AT WINTHROP (MASSACHUSETTS)
SHORE PROTECTIVE WORK AT WINTHROP (MASSACHUSETTS)
NA - SHORE BETWEEN PEMBERTON POINT AND CAPE-COD (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - CLARK POINT NEW-BEDFORD (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - PLUM ISLAND (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - QUINCY-SHORE-BEACH (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - REVERE-BEACH (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - REVERE-BEACH (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - CHATHAM (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
NA - WINTHROP-BEACH (MASSACHUSETTS) BEACH EROSION CONTROL STUDY
MATERIAL
NA - GROYNES AS BARRIERS TO MOVEMENT OF BEACH (MATERIAL)
OBSERVATIONS ON THE TRAVEL OF SHORE (MATERIAL) ALONG A CHALK FORESHORE
MATERIALS
PROTECTION OF COASTS AGAINST THE SEA WITH OR WITHOUT PREPONDERATING COASTAL DRIFT OF (MATERIALS)

MATERIALS (CONTINUED)
 SHORE PROTECTION METHODS AND [MATERIALS]
 MATERIALVANDRING
 NA - [MATERIALVANDRING] PA HARKYSTER
 MATHEMATICAL
 A [MATHEMATICAL] THEORY ABOUT SAND WAVES AND ITS APPLICATION ON THE DUTCH WADDEN ISLE OF VLIELAND
 MAURICE
 NA - NEW-JERSEY COAST OF DELAWARE-BAY FROM CAPE-MAY-CANAL TO [MAURICE] RIVER BEACH EROSION CONTROL STUDY
 MECKLENBURGS
 NA - DIE NORDOOSTLICHE HEIDE [MECKLENBURGS]
 MESH
 [MESH] JETTIES
 METHOD
 A NEW [METHOD] OF CONSTRUCTION IN COAST EROSION CONTROL
 METHODS
 NA - CONSTRUCTION OF A HEAVY DUNE COVER BY ASPHALT HASALT [METHOD] ON THE ISLAND OF BORKUM
 SHORE PROTECTION [METHODS] AND MATERIALS
 COASTAL PROTECTION REVIEW OF [METHODS] FOR DEFENCE
 EMERGENCY [METHODS] TO COMBAT BEACH EROSION
 MEXICAN
 PROTECTION WORKS ON THE [MEXICAN] COAST THE CREATION OF BEACHES AND DUNES
 MIAMI-BEACH
 ALL STEEL GROUPE - [MIAMI-BEACH]
 SEA-WALLS AND GROUINS OF STEEL SHEETING STABILIZE [MIAMI-BEACH]
 MICHIGAN
 NA - BERRIEN COUNTY [MICHIGAN] SHORE EROSION CONTROL STUDY
 NA - BEACH EROSION STUDY OHIO SHORE LINE OF LAKE-ERIE FROM OHIO - [MICHIGAN] STATE LINE TO MARBLEHEAD OHIO
 NA - LAKE-ERIE SHORE LINE FROM THE [MICHIGAN] - OHIO STATE LINE TO MARBLEHEAD OHIO BEACH EROSION CONTROL STUDY
 MILWAUKEE
 NA - BEACH EROSION STUDY LAKE-MICHIGAN SHORE LINE OF [MILWAUKEE] COUNTY #1SCUNSN
 MISSISSIPPI
 RECENT STORM DAMAGE ALONG THE COASTS OF FLORIDA AND [MISSISSIPPI]
 NA - HARRISON COUNTY [MISSISSIPPI] BEACH EROSION CONTROL STUDY
 MOCAMBIQUE
 NA - PROTECCAO DA COSTA CONTRA A EROSÃO MARÍTIMA E FORMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA COSTA DE [MOCAMBIQUE]
 MODEL
 NA - [MODEL] INVESTIGATIONS OF HARBOR INLET SILTING
 [MODEL] STUDIES IN-SITU OBSERVATIONS
 A [MODEL] STUDY OF THE BEHAVIOR OF BEACHES AND GROYNES
 NA - SUITABILITY OF [MODEL] TESTS IN MARITIME ENGINEERING IN HARBORS SEAWAYS AND COASTAL PROTECTION
 NA - [MODEL] TESTS OF BEACH BREAK AT THE END OF STABILIZED COASTAL HEADCHES LEE-EROSION
 NA - SOME IDEAS ON THE PROBLEM OF RESEARCH IN COASTAL DYNAMICS AND [MODEL] TESTS OF COASTAL PROTECTION
 NA - [MODEL] TESTS OF WAVE RUN-UP ON SEA DYKES IN WATT REGION
 NA - [MODEL] TESTS WITH MOVEABLE FLOUR IN SEA AND SEA HARBOR CONSTRUCTION
 MODELS
 TEST WITH SCALE [MODELS] TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROUINS
 SCALE EFFECTS IN [MODELS] WITH LITTORAL SAND DRIFT
 MONACO
 THE CREATION OF AN ARTIFICIAL BEACH IN LARVOTTO-BAY MONTE-CARLO PRINCIPALITY OF [MONACO]
 MONTECITO
 DETAIL OF CONCRETE BLOCK USED IN GROINS CONSTRUCTED AT [MONTECITO] CALIFORNIA
 MONTE-CARLO
 THE CREATION OF AN ARTIFICIAL BEACH IN LARVOTTO-BAY [MONTE-CARLO] PRINCIPALITY OF MONACO
 MOREHEAD-CITY
 PHOTOGRAPHS OF FORT-MACON NEAR [MOREHEAD-CITY] NORTH-CAROLINA AFTER SERIES OF HURRICANES IN 1954

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| MOTION | (MOTION) OF SAND PARTICLES BETWEEN GROINS | 5812GR0001 |
| MOVEABLE | NA - MODEL TESTS WITH (MOVEABLE) FLOOR IN SEA AND SEA HARBOR CONSTRUCTION | 5400GR0002 |
| MOVEMENT | SAND (MOVEMENT) AND BEACH EROSION | 3106GR0001 |
| | NA - GROYNES AS BARRIERS TO (MOVEMENT) OF BEACH MATERIAL | 6200GR0003 |
| | THE NEARSHORE (MOVEMENT) OF SAND AT DUNBIRN | 6207GR0001 |
| MUGU | NA - APPENDIX I COAST OF CALIFORNIA CARPENTERIA TO POINT (MUGU) BEACH EROSION CONTROL STUDY | 5210GR0007 |
| | NA - APPENDIX II COAST OF CALIFORNIA POINT (MUGU) TO SAN-PEDRO BREAKWATER BEACH EROSION CONTROL STUDY | 5311GR0002 |
| MULLET-KEY | NA - [MULLET-KEY] FLORIDA | 6610GR0002 |
| NABARIYA | NEW COASTAL WORKS AT (NABARIYA) (ISRAEL) | 6502GR0001 |
| NAVIGATION | NA - HELGOLAND HISTORY OF ITS ORIGIN AND MAINTENANCE OF ITS HARBOR RELATIVE TO (NAVIGATION) | 5500GR0009 |
| | NA - REPORT TO THE 22ND INTERNATIONAL (NAVIGATION) CONGRESS | 6900GR0003 |
| | REPORT TO THE 21ST INTERNATIONAL (NAVIGATION) CONGRESS | 6500GR0004 |
| | REPORT TO THE 22ND INTERNATIONAL (NAVIGATION) CONGRESS | 6900GR0004 |
| | REPORT TO THE 14TH INTERNATIONAL (NAVIGATION) CONGRESS | 6900GR0001 |
| | REPORT TO THE 15TH INTERNATIONAL (NAVIGATION) CONGRESS | 3300GR0003 |
| | REPORT TO THE 15TH INTERNATIONAL (NAVIGATION) CONGRESS | 3100GR0001 |
| | REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 3100GR0002 |
| | NA - REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0001 |
| | REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0002 |
| | NA - REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0005 |
| | REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0006 |
| | REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0003 |
| | REPORT TO THE 17TH INTERNATIONAL (NAVIGATION) CONGRESS | 4900GR0004 |
| NEARSHORE | THE (NEARSHORE) MOVEMENT OF SAND AT DUNBIRN | 6207GR0001 |
| NEWPORT-BAY | NA - SAN-GABRIEL RIVER TO (NEWPORT-BAY) ORANGE COUNTY CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY | 6210GR0002 |
| NEW-BEDFORD | NA - CLARK POINT (NEW-BEDFORD) MASSACHUSETTS BEACH EROSION CONTROL STUDY | 6209GR0003 |
| NEW-ENGLAND | BEHAVIOR OF BEACH FILLS IN (NEW-ENGLAND) | 6102GR0001 |
| | BEHAVIOR OF BEACH FILLS IN (NEW-ENGLAND) | 6200GR0002 |
| | BEACH EROSION CONTROL IN (NEW-ENGLAND) | 6910GR0001 |
| NEW-HAMPSHIRE | AERIAL PHOTOGRAPHS OF WALLIS-SAND STATE-BEACH RYE (NEW-HAMPSHIRE) | 6306GR0001 |
| | NA - SHORE OF THE STATE OF (NEW-HAMPSHIRE) BEACH EROSION CONTROL STUDY | 6205GR0003 |
| | NA - HAMPTON-BEACH (NEW-HAMPSHIRE) BEACH EROSION CONTROL STUDY | 5402GR0002 |
| NEW-HAVEN | NA - AREA 9 EAST RIVER TO (NEW-HAVEN) HARBOR CONNECTICUT BEACH EROSION CONTROL STUDY | 5605GR0002 |
| | NA - AREA 3 - (NEW-HAVEN) HARBOR TO HUSATONIC RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5306GR0002 |
| NEW-JERSEY | NA - RAZITAN-BAY AND SANDY-HOOK-BAY (NEW-JERSEY) | 6206GR0003 |
| | NA - GOLD-SPRING INLET (CAPE-MAY HARBOR) (NEW-JERSEY) | 5307GR0001 |
| | BEHAVIOR OF BEACH FILL AT OCEAN-CITY (NEW-JERSEY) | 5602GR0001 |
| | REPORT ON EROSION AND PROTECTION ON LONG-ISLAND AND (NEW-JERSEY) | 1506GR0001 |
| | BEACH EROSION AT MANASQUAN INLET (NEW-JERSEY) AND ADJACENT BEACHES | 3401GR0002 |
| | NA - BEACH EROSION AT MANASQUAN INLET (NEW-JERSEY) AND ADJACENT BEACHES | 3701GR0001 |
| | NA - ATLANTIC-CITY (NEW-JERSEY) BEACH EROSION CONTROL STUDY | 6407GR0002 |

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| NEW-JERSEY | (CONTINUED) | 6505GR0002 |
| NA - PERTH-AMHUY [NEW-JERSEY] BEACH EROSION CONTROL STUDY | | 5306GR0003 |
| NA - OCEAN-CITY [NEW-JERSEY] BEACH EROSION CONTROL STUDY | | 5003GR0001 |
| NA - ATLANTIC-CITY [NEW-JERSEY] BEACH EROSION CONTROL STUDY | | 6410GR0001 |
| A PICTORIAL HISTORY OF SELECTED STRUCTURES ALONG THE [NEW-JERSEY] COAST | | 6106GR0001 |
| NA - [NEW-JERSEY] COAST OF DELAWARE-BAY FROM CAPE-MAY-CANAL TO MAURICE RIVER BEACH EROSION CONTROL STUDY | | 5802GR0002 |
| NA - SHORE OF [NEW-JERSEY] FROM SANDY-HOOK TO BARNEGAT INLET BEACH EROSION CONTROL STUDY | | 5603GR0001 |
| UNFINISHED BUSINESS [NEW-JERSEY] GROIN PROJECT STALLED BY WINTER DEVELOPMENT OF THE [NEW-JERSEY] SHORE | | 5904GR0001 |
| NA - SHORE OF [NEW-JERSEY] - BARNEGAT INLET TO CAPE-MAY-CANAL BEACH EROSION CONTROL STUDY | | 5210GR0005 |
| NEW-YORK | | 5908GR0001 |
| NA - ATLANTIC COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA-BAY [NEW-YORK] | | 6506GR0001 |
| THE PROTECTION AND PRESERVATION OF THE ATLANTIC SHORE FRONT OF THE STATE OF [NEW-YORK] | | 6207GR0002 |
| NA - ATLANTIC COAST OF LONG-ISLAND FIRE-ISLAND INLET AND SHORE WESTERLY TO JONES INLET [NEW-YORK] | | 6503GR0002 |
| NA - BEACH EROSION AT JACOB-KILLS PARK LONG-ISLAND [NEW-YORK] | | 3601GR0002 |
| NA - STUDY OF AN ARTIFICIAL BATHING BEACH AT ORCHARD-BEACH PELHAM-BAY [NEW-YORK] | | 3711GR0002 |
| EFFECTIVENESS OF GROINS AT ROCKAWAY-BEACH LONG-ISLAND [NEW-YORK] | | 3812GR0001 |
| NA - STATEN ISLAND FORT-WADSWORTH TO ARTHUR-KILL [NEW-YORK] BEACH EROSION CONTROL STUDY | | 6505GR0001 |
| NA - HAMLIN-BEACH STATE-PARK [NEW-YORK] BEACH EROSION CONTROL STUDY | | 5504GR0006 |
| NA - FAIR-HAVEN-BEACH STATE-PARK [NEW-YORK] BEACH EROSION CONTROL STUDY | | 5504GR0005 |
| NA - SELKIRK-SHORES STATE-PARK [NEW-YORK] BEACH EROSION CONTROL STUDY | | 5403GR0002 |
| NA - NIAGARA COUNTY [NEW-YORK] BEACH EROSION STUDY | | 4308GR0001 |
| NA - FIRE-ISLAND INLET TO JONES INLET LONG-ISLAND [NEW-YORK] COOPERATIVE BEACH EROSION CONTROL STUDY | | 5605GR0003 |
| NEW-YORK-CITY | | 6506GR0001 |
| NA - ATLANTIC COAST OF [NEW-YORK-CITY] FROM EAST ROCKAWAY INLET TO ROCKAWAY INLET AND JAMAICA-BAY NEW-YORK | | 4308GR0001 |
| NIAGARA | | 5801GR0001 |
| NA - [NIAGARA] COUNTY NEW-YORK BEACH EROSION STUDY | | 5302GR0002 |
| NTANTIC-BAY | | 5800GR0002 |
| NA - THAMES RIVER TO [NIANTIC-BAY] CONNECTICUT BEACH EROSION CONTROL STUDY | | |
| NA - AREA - [NIANTIC-BAY] TO CONNECTICUT RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | |
| NIEDERUNGSGEBIETE | | |
| NA - SCHUTZ UND ENTWASSERUNG DER [NIEDERUNGSGEBIETE] AN DER SCHLESWIG-HOLSTEINISCHEN OSTSEEKUSTE | | |
| NORDERNEY | | |
| BEACH REHABILITATION BY USE OF BEACH FILLS AND FURTHER PLANS FOR THE PROTECTION OF THE ISLAND OF [NORDERNEY] | | |
| NA - DIE URSACHEN DER ABRUCHERSCHIEBUNGEN AN WEST UND NORDWESTSTRAND DER INSEL [NORDERNEY] | | |
| NA - GUTACHTLICHE STELLUNGNAHME ZU DEN UNTERSUCHUNGEN UBER DIE URSACHEN DER ABRUCHERSCHIEBUNGEN AM WEST UND NORD WESTSTRAND DER INSEL [NORDERNEY] | | |
| NA - THE EFFECT OF ISLAND PROTECTIVE STRUCTURES ON BEACH DEVELOPMENT IN WEST PART OF [NORDERNEY] | | |
| NA - ORIGIN AND DEVELOPMENT OF ISLAND PROTECTIVE WORKS ON [NORDERNEY] | | |
| NA - ARTIFICIAL RESTORATION OF BEACHES WITH SPECIAL REGARD FOR BEACH FLUSHING [NORDERNEY] 1951-52 | | |
| NORDSEE | | |
| NA - HUNDERT JAHRE KUSTENSCHUTZ AN DER [NORDSEE] | | |
| NORDWAGRIEN | | |
| NA - GRUNDUNTERSUCHUNGEN AN DEN KUSTEN VON FEHMARN UND [NORDWAGRIEN] | | |
| NA - KUSTENFORSCHUNGEN IM RAUM FEHMARN [NORDWAGRIEN] | | |
| NORDWESTKUSTE | | |
| NA - DIE ABRUCHERSACHEN AN DER [NORDWESTKUSTE] DES ELLENHOGENS AUF SYLT | | |
| NORDWESTSTRAND | | |
| NA - DIE URSACHEN DER ABRUCHERSCHIEBUNGEN AN WEST UND [NORDWESTSTRAND] DER INSEL NORDERNEY | | |
| NORTH | | |
| NA - WATER ECONOMY BETWEEN [NORTH] AND BALFIC-SEA KIEL | | |
| EROSION AND PALMETTO GROINS AT [NORTH] POINT ST.AUGUSTINE FLORIDA | | |
| SHORE EROSION AND CABBAGE PALMETTO GROINS AT [NORTH] POINT ST.AUGUSTINE FLORIDA | | |
| BEACH BEHAVIOR [NORTH] SHORE LONG-ISLAND SOUND | | |
| THE [NORTH] SHORE VERSUS LAKE-MICHIGAN | | |

NORTH-CAROLINA
 NA - CAROLINA-BEACH AND VICINITY [NORTH-CAROLINA] 6205GR0002
 NA - OCRACOKE ISLAND [NORTH-CAROLINA] 6503GR0001
 NA - FORT-MACON - ATLANTIC-BEACH AND VICINITY [NORTH-CAROLINA] 6209GR0002
 NA - FORT-FISHER [NORTH-CAROLINA] 3201GR0001
 NA - WRIGHTSVILLE-BEACH [NORTH-CAROLINA] 3401GR0001
 PHOTOGRAPHS OF FORT-MACON NEAR MOREHEAD-CITY [NORTH-CAROLINA] AFTER SERIES OF HURRICANES IN 1954 5400GR0001
 NA - [NORTH-CAROLINA] SHORE LINE BEACH EROSION STUDY 4812GR0001
 NORTH-SEA
 NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF FLOATING ISLANDS OF THE SOUTH COAST OF GERMANY [NORTH-SEA] 5700GR0004
 NA - WATER ECONOMY BETWEEN [NORTH-SEA] AND BALTIC-SEA 1948-58 5800GR0005
 INFLUENCE OF PROTECTIVE WORKS ON THE EROSION OF THE WEST COAST OF SYLT [NORTH-SEA] COAST OF GERMANY 0000GR0003
 COAST PROTECTION ON THE [NORTH-SEA] COASTS OF HOLLAND FRANCE BELGIUM AND GERMANY 3703GR0001
 OAHU
 NA - HALEIUA-BEACH [OAHU] HAWAII BEACH EROSION CONTROL STUDY 6503GR0004
 NA - WAIKIKI-BEACH [OAHU] HAWAII BEACH EROSION CONTROL STUDY 6503GR0003
 NA - WAIKIKI-BEACH ISLAND OF [OAHU] T. H. BEACH EROSION CONTROL STUDY 5308GR0001
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 MODEL STUDIES IN-SITU OBSERVATIONS)
 NA - THEORETICAL (OBSERVATIONS) FOR INSTALLATION OF COASTAL PROTECTIVE STRUCTURES ON TIDELESS SHORES (OBSERVATIONS) ON THE TRAVEL OF SHORE MATERIAL ALONG A CHALK FRESHORE 7000GR0003
 NA - [OCEANSIDE] OCEAN-BEACH IMPERIAL-BEACH AND CUNHADO SAN-DIEGO COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY 5409GR0005
 OCEAN-BEACH
 NA - OCEANSIDE [OCEAN-BEACH] IMPERIAL-BEACH AND CUNHADO SAN-DIEGO COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY 5605GR0001
 OCEAN-CITY
 MARYLANDS FAVORITE BEACH AT [OCEAN-CITY]
 BEHAVIOR OF SAND ASPHALT GROINS AT [OCEAN-CITY] MARYLAND 5510GR0001
 INTERIM REPORT ON ASPHALT GROINS AT [OCEAN-CITY] MARYLAND 5905GR0001
 THE ASPHALT GROINS AT [OCEAN-CITY] MARYLAND 5607GR0001
 BEHAVIOR OF BEACH FILL AT [OCEAN-CITY] NEW-JERSEY 5504GR0001
 NA - [OCEAN-CITY] NEW-JERSEY BEACH EROSION CONTROL STUDY 5602GR0001
 OCEANOGRAPHICAL
 [OCEANOGRAPHICAL] ENGINEERING 5306GR0003
 OCRACOKE
 NA - [OCRACOKE] ISLAND NORTH-CAROLINA 6400GR0003
 NA - [OCRACOKE] ISLAND NORTH-CAROLINA 6503GR0001
 OHIO
 NA - LAKE-ERIE SHORE LINE FROM THE ALCHIGAN - OHIO STATE LINE TO MARBLEHEAD [OHIO] BEACH EROSION CONTROL STUDY 6101GR0002
 NA - SHORE OF SHEFFIELD-LAKE COMMUNITY PARK [OHIO] BEACH EROSION CONTROL STUDY 6205GR0001
 NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE SANDUSKY BAY [OHIO] BEACH EROSION CONTROL STUDY 5904GR0002
 NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE SANDUSKY TO VERMILLION [OHIO] BEACH EROSION CONTROL STUDY 5212GR0002
 NA - CLEVELAND AND LAKEWOOD [OHIO] BEACH EROSION CONTROL STUDY 5003GR0002
 NA - APPENDIX IX - SHORE OF LAKE-ERIE IN LAKE COUNTY [OHIO] BEACH EROSION CONTROL STUDY 5005GR0001
 PERMEABLE AND SEMIPERMEABLE GROINS FROM [OHIO] ON LAKE-ERIE 6500GR0003
 NA - APPENDICES III AND ALL [OHIO] SHORE LINE OF LAKE-ERIE BETWEEN FAIRPORT AND ASHTABULA BEACH EROSION CONTROL STUDY 5201GR0002
 NA - APPENDIX VIII [OHIO] SHORE LINE OF LAKE-ERIE BETWEEN VERMILLION AND SHEFFIELD-LAKE-VILLAGE BEACH EROSION CONTROL STUDY 5308GR0003
 NA - APPENDICES V AND X [OHIO] SHORE LINE OF LAKE-ERIE BETWEEN ASHTABULA AND THE PENNSYLVANIA STATE LINE BEACH EROSION CONTROL STUDY 5201GR0003
 NA - APPENDIX XI [OHIO] SHORE LINE OF LAKE-ERIE EUCLID TO CHAGRIN RIVER BEACH EROSION CONTROL STUDY 5402GR0001
 NA - BEACH EROSION STUDY [OHIO] SHORE LINE OF LAKE-ERIE FROM OHIO - MICHIGAN STATE LINE TO MARBLEHEAD OHIO 5405GR0002
 NA - APPENDIX IV [OHIO] SHORE LINE OF LAKE-ERIE SANDUSKY BAY OHIO BEACH EROSION CONTROL STUDY 5304GR0002
 NA - APPENDIX IV [OHIO] SHORE LINE OF LAKE-ERIE SANDUSKY TO VERMILLION OHIO BEACH EROSION CONTROL STUDY 5212GR0002

OHIO (CONTINUED)
 NA - APPENDIX AIV (OHIO) SHORE LINE OF LAKE-ERIE SHEFFIELD-LAKE-VILLAGE TO ROCKY RIVER BEACH EROSION CONTROL STUDY
 EFFECTS OF LARGE STRUCTURES ON THE (OHIO) SHORE OF LAKE-ERIE
 EROSION PROBLEMS ON THE (OHIO) SHORE OF LAKE-ERIE
 NA - LAKE-ERIE SHORE LINE FROM THE MICHIGAN - (OHIO) STATE LINE TO MARBLEHEAD OHIO BEACH EROSION CONTROL STUDY
 NA - BEACH EROSION STUDY OHIO SHORE LINE OF LAKE-ERIE FROM (OHIO) - MICHIGAN STATE LINE TO MARBLEHEAD OHIO
 ORANGE
 NA - BEACH EROSION STUDY (ORANGE) COUNTY CALIFORNIA
 NA - BEACH EROSION STUDY (ORANGE) COUNTY CALIFORNIA
 NA - SAN-GABRIEL RIVER TO NEWPORT-BAY (ORANGE) COUNTY CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY
 ORCHARD-BEACH
 NA - STUDY OF AN ARTIFICIAL BATHING BEACH AT (ORCHARD-BEACH) PELHAM-BAY NEW-YORK
 ORIGIN
 NA - (ORIGIN) AND DECLINE OF THE ISLAND IRISHCHEN
 NA - (ORIGIN) AND DEVELOPMENT OF ISLAND PROTECTIVE WORKS ON NORDERNEY
 NA - HELGOLAND HISTORY OF ITS (ORIGIN) AND MAINTENANCE OF ITS HARBOR RELATIVE TO NAVIGATION
 THE (ORIGIN) AND STABILITY OF BEACHES
 OSTSEEKUSTE
 NA - ABBRUCH UND SCHUTZ DER STEILUFER AN DER (OSTSEEKUSTE)
 NA - SCHUTZ UND ENTWASSERUNG DER NIEDERUNGSGEBIETE AN DER SCHLESWIG-HOLSTEINISCHEN (OSTSEEKUSTE)
 PALMETTO
 SHORE EROSION AND CABBAGE (PALMETTO) GROINS AT NORTH POINT ST-AUGUSTINE FLORIDA
 EROSION AND (PALMETTO) GROINS AT NORTH POINT ST-AUGUSTINE FLORIDA
 PALM-BEACH
 NA - (PALM-BEACH) COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM SOUTH-LAKE-WORTH INLET TO BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
 NA - (PALM-BEACH) COUNTY FROM LAKE-WORTH INLET TO SOUTH-LAKE-WORTH INLET FLORIDA BEACH EROSION CONTROL STUDY
 DETERIORATION OF STEEL SHEET PILE GROINS AT (PALM-BEACH) FLORIDA
 EXPERIMENTAL STEEL SHEET PILE GROINS (PALM-BEACH) FLORIDA
 NA - (PALM-BEACH) FLORIDA BEACH EROSION STUDY
 PARK
 NA - BEACH EROSION AT JACOB-RITTS (PARK) LONG-ISLAND NEW-YORK
 NA - SHORE OF SHEFFIELD-LAKE COMMUNITY (PARK) OHIO BEACH EROSION CONTROL STUDY
 PARTICLE
 EFFECT OF (PARTICLE) SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE PENINSULA PENNSYLVANIA
 PARTICLES
 MOTION OF SAND (PARTICLES) BETWEEN GROINS
 PATENT
 NA - (PATENT) NO 19786
 PAWCATUCK
 NA - AREA 5 (PAWCATUCK) RIVER TO THAMES RIVER CONNECTICUT BEACH EROSION CONTROL STUDY
 PELHAM-BAY
 NA - STUDY OF AN ARTIFICIAL BATHING BEACH AT ORCHARD-BEACH (PELHAM-BAY) NEW-YORK
 PEMBERTON
 NA - SHORE BETWEEN (PEMBERTON) POINT AND CAPE-COD MASSACHUSETTS BEACH EROSION CONTROL STUDY
 PENINSULA
 FEEDER BEACHES AND GROINS RESTORE PRESQUE-ISLE (PENINSULA)
 BEACH PROTECTION ENGINEERS ATTEMPT TO OUTWIT NATURE AT PRESQUE-ISLE (PENINSULA)
 NA - PRESQUE-ISLE (PENINSULA) ERIE PENNSYLVANIA BEACH EROSION CONTROL STUDY
 NA - PRESQUE-ISLE (PENINSULA) ERIE PENNSYLVANIA BEACH EROSION CONTROL STUDY
 EFFECT OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE (PENINSULA) PENNSYLVANIA
 CASE HISTORY OF SHORE PROTECTION AT PRESQUE-ISLE (PENINSULA) PENNSYLVANIA

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| PENNSYLVANIA | 6805GR0001 |
| EFFECT OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE PENINSULA (PENNSYLVANIA) | 5210GR0003 |
| CASE HISTORY OF SHORE PROTECTION AT PRESQUE-ISLE PENINSULA (PENNSYLVANIA) | 5308GR0004 |
| NA - PRESQUE-ISLE PENINSULA ERIE (PENNSYLVANIA) BEACH EROSION CONTROL STUDY | 5005GR0002 |
| NA - PRESQUE-ISLE PENINSULA ERIE (PENNSYLVANIA) BEACH EROSION CONTROL STUDY | 5201GR0003 |
| NA - APPENDIXES IV AND V OHIO SHORE LINE OF LAKE-ERIE BETWEEN ASHTABULA AND THE (PENNSYLVANIA) STATE LINE BEACH EROSION CONTROL STUDY | 0000GR0008 |
| PERMEABILITY | 6500GR0003 |
| THE PRINCIPLE OF INCREASING (PERMEABILITY) IN GROIN CONSTRUCTION | 6006GR0005 |
| PERMEABLE | 0000GR0005 |
| (PERMEABLE) AND SEMIPERMEABLE GROINS FROM OHIO ON LAKE-ERIE | 0000GR0006 |
| SCOURING DUE TO WAVE ACTION AT THE TUE OF (PERMEABLE) COASTAL STRUCTURES | 5700GR0001 |
| THE WISENITZ PRECAST (PERMEABLE) GROIN | 3907GR0001 |
| THE BUDD HORIZONTALLY (PERMEABLE) GROIN SYSTEM FOR BEACH EROSION CONTROL AND REBUILDING SAND BEACHES | 4001GR0001 |
| IMPERMEABLE AND (PERMEABLE) GROINS | 3500GR0002 |
| SHORE PROTECTION BY (PERMEABLE) GROINS | 3500GR0001 |
| (PERMEABLE) GROINS AT KENOSHA WISCONSIN | 4507GR0001 |
| (PERMEABLE) GROINS FROM ILLINOIS ON LAKE-MICHIGAN | 3911GR0001 |
| NA - (PERMEABLE) GROINS OF CONCRETE CHECK BEACH EROSION | 6505GR0002 |
| (PERMEABLE) JETTIES BUILT TO PROTECT CLEVELAND'S SHORE | 7009GR0002 |
| EFFECTIVENESS OF (PERMEABLE) TYPE GROINS USED FOR BEACH PROTECTION AT SHOREWOOD WISCONSIN AND OTHER CITIES | 5705GR0001 |
| ALONG THE WEST SHORE OF LAKE-MICHIGAN | 5400GR0001 |
| PERT-A-MHOY | 5705GR0002 |
| NA - (PERT-A-MHOY) NEW-JERSEY BEACH EROSION CONTROL STUDY | 5705GR0001 |
| PHENOMENA | 6306GR0001 |
| SOME SAND TRANSPORT (PHENOMENA) ON COASTS WITH BARS | 6208GR0001 |
| PHOTOGRAPHS | 6410GR0001 |
| (PHOTOGRAPHS) OF CUNEO-BEACH WESTPORT CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT | 4602GR0002 |
| (PHOTOGRAPHS) OF FORT-MACON NEAR MOREHEAD-CITY NORTH-CAROLINA AFTER SERIES OF HURRICANES IN 1954 | 4910GR0001 |
| (PHOTOGRAPHS) OF SARASOTA COUNTY FLORIDA SHOWING GROIN INSTALLATION | 4800GR0001 |
| (PHOTOGRAPHS) OF SASSON-HILL-BEACH FAIRFIELD CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT | 3306GR0001 |
| AERIAL (PHOTOGRAPHS) OF WALLIS-SAND STATE-BEACH RYE NEW-HAMPSHIRE | 5210GR0002 |
| AERIAL (PHOTOGRAPHS) PLUM ISLAND MASSACHUSETTS | 3607GR0002 |
| PICTORIAL | 4410GR0001 |
| A (PICTORIAL) HISTORY OF SELECTED STRUCTURES ALONG THE NEW-JERSEY COAST | 6210GR0001 |
| PIERS | 5202GR0001 |
| (PIERS) AND JETTIES OF PRECAST CONCRETE | 3607GR0002 |
| PILE | 4410GR0001 |
| DETERIORATION OF STEEL SHEET (PILE) GROINS AT PALM-BEACH FLORIDA | 4800GR0001 |
| EXPERIMENTAL STEEL SHEET (PILE) GROINS PALM-BEACH FLORIDA | 3306GR0001 |
| DO-PLAT-TAYLOR ADJUSTABLE SCREW (PILE) GROINS | 5210GR0002 |
| LIFE OF STEEL SHEET (PILE) STRUCTURES IN ATLANTIC COASTAL STATES | 3607GR0002 |
| PILING | 4410GR0001 |
| INVESTIGATIONS OF STEEL SHEET (PILING) | 6210GR0001 |
| STEEL SHEET (PILING) FOR SHORE AND BEACH PROTECTION STRUCTURES | 5202GR0001 |
| SHEET STEEL (PILING) FOR SHORE PROTECTION STRUCTURES | 6610GR0001 |
| DURABILITY OF STEEL SHEET (PILING) IN SHORE STRUCTURES | 5404GR0001 |
| PINELLAS | 6610GR0001 |
| NA - (PINELLAS) COUNTY FLORIDA | 5404GR0001 |
| NA - (PINELLAS) COUNTY FLORIDA BEACH EROSION CONTROL STUDY | 6606GR0002 |
| PLANNING | 5800GR0007 |
| SHORE PROTECTION (PLANNING) AND DESIGN | 4910GR0003 |
| NA - SHELL AND SURGE AS BASIS FOR (PLANNING) AND DESIGN IN SEA STRUCTURES AND COASTAL PROTECTION | 6008GR0005 |
| (PLANNING) SHORE PROTECTION | |
| PLANS | |
| BEACH REHABILITATION BY USE OF BEACH FILLS AND FURTHER (PLANS) FOR THE PROTECTION OF THE ISLAND OF NORDEY | |

| | | |
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| PLUM | AERIAL PHOTOGRAPHS [PLUM] ISLAND MASSACHUSETTS | 6208GR0001 |
| | NA - [PLUM] ISLAND MASSACHUSETTS BEACH EROSION CONTROL STUDY | 5308GR0002 |
| POINT | | |
| | NA - SHORE BETWEEN PENDERTON [POINT] AND CAPE-COD MASSACHUSETTS BEACH EROSION CONTROL STUDY | 5910GR0001 |
| | NA - BELLE-PASS TO RACQUON [POINT] LOUISIANA BEACH EROSION CONTROL STUDY | 6202GR0001 |
| | REPORT ON SHORE EROSION AT TILGHMAN [POINT] MARYLAND | 4006GR0001 |
| | NA - APPENDIX I COAST OF CALIFORNIA CAMPENIERIA TO [POINT] MUGU BEACH EROSION CONTROL STUDY | 5211GR0002 |
| | NA - APPENDIX II COAST OF CALIFORNIA CAMPENIERIA TO [POINT] MUGU TO SAN-PEDRO BREAKWATER BEACH EROSION CONTROL STUDY | 5311GR0002 |
| | NA - CLARK [POINT] NEW-REDFORD MASSACHUSETTS BEACH EROSION CONTROL STUDY | 6205GR0003 |
| | SHORE EROSION AND CABBAGE PALMETTO GROINS AT NORTH [POINT] ST-AUGUSTINE FLORIDA | 3811GR0001 |
| | SHORE AND PALMETTO GROINS AT NORTH [POINT] ST-AUGUSTINE FLORIDA | 3912GR0001 |
| | NA - APPENDIX VI HUBBOLDT-BAY (BURNIE [POINT]) CALIFORNIA BEACH EROSION CONTROL STUDY | 5709GR0001 |
| POMPANO-BEACH | | |
| | COASTAL ENGINEERING STUDY AT [POMPANO-BEACH] | 5903GR0002 |
| PRAIAS | | |
| | NA - PROTECCAO DA COSTA CONTRA A EROSAO MARITIMA E FORMACAO DE [PRAIAS] DE ARCIA - DOIS PROBLEMAS NA COSTA DE MOCAMBIQUE | 6400GR0004 |
| PRECAST | | |
| | PIERS AND JETTIES OF [PRECAST] CONCRETE | 4602GR0002 |
| | [PRECAST] CONCRETE BLOCK GROINS | 5304GR0001 |
| | THE WOSENITZ [PRECAST] PERMEABLE GROIN | 0000GR0005 |
| PRESERVATION | | |
| | THE PROTECTION AND [PRESERVATION] OF THE ATLANTIC SHORE FRONT OF THE STATE OF NEW-YORK | 6207GR0002 |
| PRESQUE-ISLE | | |
| | FEDER REACHES AND GROINS RESTORE [PRESQUE-ISLE] PENINSULA | 5803GR0001 |
| | BEACH PROTECTION ENGINEERS ATTEMPT TO OUTFIT NATURE AT [PRESQUE-ISLE] PENINSULA | 5109GR0001 |
| | NA - [PRESQUE-ISLE] PENINSULA ERIE PENNSYLVANIA BEACH EROSION CONTROL STUDY | 5308GR0004 |
| | NA - [PRESQUE-ISLE] PENINSULA ERIE PENNSYLVANIA BEACH EROSION CONTROL STUDY | 5005GR0002 |
| | EFFECT OF PARTICLE SIZE AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH [PRESQUE-ISLE] PENINSULA PENNSYLVANIA | 6805GR0001 |
| | CASE HISTORY OF SHORE PROTECTION AT [PRESQUE-ISLE] PENINSULA PENNSYLVANIA | 5210GR0003 |
| PREVENTION | | |
| | THE [PREVENTION] OF COAST EROSION | 4000GR0003 |
| | THE [PREVENTION] OF COAST EROSION | 4104GR0001 |
| PRICES | | |
| | -HOW TO BUILD A BEACH AT ECONOMY [PRICES] | 5509GR0001 |
| PRINCIPLE | | |
| | THE [PRINCIPLE] OF INCREASING PERMEABILITY IN GROIN CONSTRUCTION | 0000GR0008 |
| PRINCIPLES | | |
| | (PRINCIPLES) OF SHORE PROTECTION FOR THE GREAT-LAKES | 5310GR0002 |
| PROBLEM | | |
| | LITTORAL DRIFT [PROBLEM] AT SHORE-LINE HARBOURS | 5900GR0003 |
| | THE TERMINAL [PROBLEM] IN COAST PROTECTION | 6409GR0005 |
| | THE [PROBLEM] OF COAST EROSION | 4700GR0001 |
| | NA - SOME IDEAS ON THE [PROBLEM] OF RESEARCH IN COASTAL DYNAMICS AND MODEL TESTS OF COASTAL PROTECTION | 5600GR0001 |
| PROBLEMAS | | |
| | NA - PROTECCAO DA COSTA CONTRA A EROSAO MARITIMA E FORMACAO DE PRAIAS DE ARCIA - DOIS [PROBLEMAS] NA COSTA DE MOCAMBIQUE | 6400GR0004 |
| PROBLEMS | | |
| | CHARACTERISTICS OF SHINGLE BEACHES: THE SOLUTION TO SOME PRACTICAL [PROBLEMS] | 7009GR0006 |
| | FLORIDA COASTAL [PROBLEMS] | 5712GR0001 |
| | CALIFORNIA BEACH EROSION AND DEVELOPMENT [PROBLEMS] | 3610GR0001 |
| | THE DANISH WESTCOAST - LITTORAL DRIFT [PROBLEMS] AND MEASURES AGAINST COAST EROSION | 5008GR0001 |
| | [PROBLEMS] DE DEFENSE DES COTES RESUSITE DE ECHECS DE QUELQUES OUVRAGES | 5409GR0003 |
| | SOME COASTAL ENGINEERING [PROBLEMS] IN INDIA | 5712GR0002 |
| | COASTAL PROTECTION WORKS AND RELATED [PROBLEMS] IN JAPAN | 6008GR0004 |

PROBLEMS (CONTINUED)
 ROUND-TABLE DISCUSSION OF SHORE PROBLEMS IN RELATION TO RECREATION
 NA - ACTUAL PROBLEMS OF COASTAL PROTECTION
 NA - PROBLEMS OF ISLAND AND COAST PROTECTION
 EROSION PROBLEMS ON THE WHOLE SHORE OF LAKE-ERIE
 PROCEDURES
 COASTAL PROTECTION PROCESSES WITH SPECIAL REFERENCE TO CONDITIONS IN FLORIDA
 PROCESSES
 COASTAL PROCESSES
 GENERALITIES ON COASTAL PROCESSES AND PROTECTION
 LITTORAL PROCESSES AND THE DEVELOPMENT OF SHORELINES
 LITTORAL PROCESSES ON SANDY COASTS
 PROFILE
 STABILIZATION OF SINGLE ALLUVIAL SHORES BY GROINS OF FULL PROFILE
 PROFILES
 COAST EROSION AND THE DEVELOPMENT OF BEACH PROFILES
 THE DEVELOPMENT OF COAST PROFILES ON A RECEIVING COAST PROTECTED BY GROYNES
 PROJECT
 UNFINISHED BUSINESS NEW-JERSEY GROIN PROJECT STALLED BY WINTER
 PROJECTS
 PARTICIPATION OF FEDERAL RELIEF AGENCIES IN BEACH PROTECTION PROJECTS
 PROSPECT-BEACH
 BEHAVIOR OF BEACH FILL AND BORROW AREA AT PROSPECT-BEACH WEST-HAVEN CONNECTICUT
 PROTECCAO
 NA - PROTECCAO JA COSTA CONTRA A ERUSAO MARITIMA E FURMACAO DE PRAIAS DE ARCIA - DOIS PROBLEMAS NA COSTA DE
 MOCAMBIQUE
 PROTECT
 PERMEABLE JETTIES HUILT TO PROTECT CLEVELANDS SHORE
 PROTECTED
 ONE ASPECT OF THE DYNAMICS OF A COAST PARTLY PROTECTED BY A ROW OF GROYNES
 THE DEVELOPMENT OF COAST PROFILES ON A RECEIVING COAST PROTECTED BY GROYNES
 PROTECTING
 PROTECTING GALVESTON-BEACH
 PROTECTING OUR SHORE LINE
 PROTECTION
 THE TERMINAL PROBLEM IN COAST PROTECTION
 STRUCTURES FOR SHORE PROTECTION
 EXPERIMENT IN SHORE PROTECTION
 USE OF CONCRETE FOR SHORE PROTECTION
 NA - ACTUAL PROBLEMS OF COASTAL PROTECTION
 NA - BIOLOGICAL HELP IN COASTAL PROTECTION
 CONCRETE SHORE PROTECTION
 GENERALITIES ON COASTAL PROCESSES AND PROTECTION
 COASTAL DEVELOPMENT AND COASTAL PROTECTION
 NA - SUITABILITY OF MODEL TESTS IN MARITIME ENGINEERING IN HARBORS SEAWAYS AND COASTAL PROTECTION
 NA - SOME IDEAS ON THE PROBLEM OF RESEARCH IN COASTAL DYNAMICS AND MODEL TESTS OF COASTAL PROTECTION
 NA - SWELL AND SURGE AS BASIS FOR PLANNING AND DESIGN IN SEA STRUCTURES AND COASTAL PROTECTION
 NA - POSSIBILITIES AND LIMITS FOR APPLICATION OF ASPHALT TYPES OF CONSTRUCTIONS FOR COASTAL PROTECTION
 PLANNING SHORE PROTECTION
 NA - UNDERWATER LONGITUDINAL WORKS FOR COASTAL PROTECTION
 COAST PROTECTION
 COAST EROSION AND FORESHORE PROTECTION
 ART OF BEACH PROTECTION
 NA - PROBLEMS OF ISLAND AND COAST PROTECTION
 CERTAIN POINTS ABOUT EROSION COSTS AND MEASURES OF PROTECTION
 NA - FLOOD PROTECTION AND COAST STABILIZATION
 THE PROTECTION AND IMPROVEMENT OF FORESHORES BY THE UTILIZATION OF TIDAL AND WAVE ACTION

PROTECTION

(CONTINUED)

- THE [PROTECTION] AND PRESERVATION OF THE ATLANTIC SHORE FRONT OF THE STATE OF NEW-YORK
- NA - COASTAL [PROTECTION] AND SCIENTIFIC BASIS OF RESEARCH
- CASE HISTORY OF SHORE [PROTECTION] AT PRESQUE-ISLE PENINSULA PENNSYLVANIA
- EFFECTIVENESS OF PERMEABLE TYPE GROINS USED FOR BEACH [PROTECTION] AT SHOREWOOD WISCONSIN AND OTHER CITIES
- ALONG THE WEST SHORE OF LAKE-MICHIGAN
- REVIEW OF GERMAN EXPERIENCE ON COASTAL [PROTECTION] BY GROINS
- SHORE [PROTECTION] BY PERMEABLE GROINS
- NA - [PROTECTION] DES COTES CONTRE L'EROSION MARITIME ET FORMATION DES PLAGES DE SABLE
- BEACH [PROTECTION] ENGINEERS ATTEMPT TO DIMIT NATURE AT PRESQUE-ISLE PENINSULA
- SHORE [PROTECTION] EXPERIENCE IN THE UNITED STATES
- COASTAL [PROTECTION] FOR FLORIDA
- PRINCIPLES OF SHORE [PROTECTION] FOR THE GREAT-LAKES
- SOME ASPECTS OF SHORE [PROTECTION] IN BOSTON HARBOR
- INFORMATION ON BEACH [PROTECTION] IN FLORIDA
- COASTAL [PROTECTION] IN MASSACHUSETTS
- REPORT OF ADVISORY-BUARD ON BEACH [PROTECTION] LOS-ANGELES COUNTY
- BEACH [PROTECTION] MEASURES
- BEACH [PROTECTION] METHODS AND MATERIALS
- [SHORE] [PROTECTION] OF COASTS AGAINST THE SEA WITH OR WITHOUT PREPONDERATING COASTAL DRIFT OF MATERIALS
- GALVESTON ISLAND SHORELINE AND THE [PROTECTION] OF GALVESTON-BEACH
- NA - WHAT HAPPENED TO [PROTECTION] OF OUR BALTIC-SEA COAST
- CONSTRUCTION WORKS FOR THE [PROTECTION] OF THE COASTS
- NA - COASTAL CHANGES AND COASTAL [PROTECTION] OF THE ISLAND HIDDENSEE
- BEACH REHABILITATION BY USE OF BEACH FILLS AND FURTHER PLANS FOR THE [PROTECTION] OF THE ISLAND OF NORDERNEY
- NA - GENERAL COASTAL DYNAMICS AND COASTAL [PROTECTION] OF THE SOUTH BALTIC-SEA BETWEEN TRAVE AND SWINE
- NA - [PROTECTION] OF THE WEST BEACH OF SYLT ISLAND BY FLAT GROINS
- SEA DEFENCE EROSION AND [PROTECTION] ON A SANDY COAST
- NA - ISLAND [PROTECTION] ON EAST FRIESIAN COAST
- COAST EROSION AND [PROTECTION] ON LONG-ISLAND AND NEW-JERSEY
- SHORE [PROTECTION] ON THE COAST OF YALZU
- COAST [PROTECTION] ON THE NORTH-SEA COASTS OF HOLLAND FRANCE BELGIUM AND GERMANY
- SHORE [PROTECTION] PLANNING AND DESIGN
- COASTAL [PROTECTION] PROCEDURES WITH SPECIAL REFERENCE TO CONDITIONS IN FLORIDA
- PARTICIPATION OF FEDERAL RELIEF AGENCIES IN BEACH [PROTECTION] PROJECTS
- COASTAL [PROTECTION] REVIEW OF METHODS FOR DEFENCE
- THE SELSEY COAST [PROTECTION] SCHEME
- COAST [PROTECTION] SOME RECENT WORKS ON THE EAST COAST 1942-52
- SHEET STEEL PILING FOR SHORE [PROTECTION] STRUCTURES
- STEEL SHEET PILING FOR SHORE AND BEACH [PROTECTION] STRUCTURES
- CONCRETE SHORE [PROTECTION] STRUCTURES
- LOW COST SHORE [PROTECTION] USED ON THE GREAT-LAKES
- SOME DATA ON BEACH [PROTECTION] WORKS
- COASTAL [PROTECTION] WORKS AND RELATED PROBLEMS IN JAPAN
- BEACH EROSION AND [PROTECTION] WORKS IN IMAZU-SAKANO-BEACH
- [PROTECTION] WORKS ON THE MEXICAN COAST THE CREATION OF BEACHES AND DUNES
- COAST [PROTECTION] - GROINE SYSTEMS
- NA - COAST [PROTECTION] - GROINES
- COAST EROSION AND [PROTECTION] - STUDIES IN CAUSES AND REMEDIES
- PROTECTIVE
- ART OF FORMING [PROTECTIVE] BEACHES
- NA - BEACH ABRASION BY WAVES - REFLECTION ON STEEP WALL TYPE OF COASTAL [PROTECTIVE] STRUCTURES
- NA - THE EFFECT OF ISLAND [PROTECTIVE] STRUCTURES ON BEACH DEVELOPMENT IN WEST PART OF NORDERNEY
- NA - EFFECTS OF COASTAL [PROTECTIVE] STRUCTURES ON SYLT
- NA - THEORETICAL OBSERVATIONS FOR INSTALLATION OF COASTAL [PROTECTIVE] STRUCTURES ON TIDELESS SHORES
- SHORE [PROTECTIVE] WORK AT WINTHROP MASSACHUSETTS

PROTECTIVE (CONTINUED)
 SHORE (PROTECTIVE) WORK AT WINTHROP MASSACHUSETTS
 PAPER ON (PROTECTIVE) WORKS ADAPTED TO LIMIT EROSION ALONG THE OPEN COAST HOW THEY WORK
 NA - ORIGIN AND DEVELOPMENT OF ISLAND (PROTECTIVE) WORKS ON NORDERNEY
 NA - DUNE (PROTECTIVE) WORKS ON SYLT
 INFLUENCE OF (PROTECTIVE) WORKS ON THE EROSION OF THE WEST COAST OF SYLT NORTH-SEA COAST OF GERMANY
 PROTECTS
 SHOREWOOD (PROTECTS) ITS LAKE FRONT
 PUBLIC
 CONEY ISLAND (PUBLIC) BEACH AND BOARDWALK IMPROVEMENT
 CONSTRUCTION AND MAINTENANCE OF THE (PUBLIC) BEACH AT HOCKAWAY-BEACH BOROUGH OF QUEENS
 PUERTO-RICO
 NA - SAN-JUAN (PUERTO-RICO) BEACH EROSION CONTROL STUDY
 PUNTA-LAS-MARIAS
 NA - (PUNTA-LAS-MARIAS) SAN-JUAN P. R. BEACH EROSION CONTROL STUDY
 QUEENS
 CONSTRUCTION AND MAINTENANCE OF THE PUBLIC BEACH AT HOCKAWAY-BEACH BOROUGH OF [QUEENS]
 QUINCY-SHORE-BEACH
 NA - [QUINCY-SHORE-BEACH] MASSACHUSETTS BEACH EROSION CONTROL STUDY
 RACCOON
 NA - BELLE-PASS TO [RACCOON] POINT LOUISIANA BEACH EROSION CONTROL STUDY
 RACINE
 NA - [RACINE] COUNTY WISCONSIN BEACH EROSION CONTROL STUDY
 RARITAN-BAY
 NA - [RARITAN-BAY] AND SANDY-HOOK-BAY NEW-JERSEY
 RATE
 LABORATORY STUDY OF THE EFFECT OF GROINS ON THE [RATE] OF LITTORAL TRANSPORT EQUIPMENT DEVELOPMENT AND INITIAL TESTS
 REBUILDING
 THE BUDD HORIZONTALLY PERMEABLE GROIN SYSTEM FOR BEACH EROSION CONTROL AND [REBUILDING] SAND BEACHES
 RECEDING
 THE DEVELOPMENT OF COAST PROFILES ON A [RECEDING] COAST PROTECTED BY GROYNES
 [RECEDING] OF SHORELINE AT COCHIN BY GROYNES AND A SEAWALL
 RECENT
 [RECENT] STORM DAMAGE ALONG THE COASTS OF FLORIDA AND MISSISSIPPI
 COAST PROTECTION SOME [RECENT] WORKS ON THE EAST COAST 1942-52
 RECLAIMED
 SOME SEA DEFENCE WORKS FOR [RECLAIMED] LANDS
 RECLAMATION
 NA - CULTIVATED LAND CONSERVATION AND [RECLAMATION]
 LAND [RECLAMATION] AND GROIN-BUILDING IN THE TIDAL FLATS
 RECREATION
 ROUND-TABLE DISCUSSION OF SHORE PROBLEMS IN RELATION TO [RECREATION]
 REGION
 NA - GROINS WITH ASPHALT GROUT IN EAST FRIESIAN COAST (REGION)
 NA - MODEL TESTS OF WAVE RUN-UP ON SEA DYKES IN WATT (REGION)
 REHABILITATION
 BEACH [REHABILITATION] BY USE OF BEACH FILLS AND FURTHER PLANS FOR THE PROTECTION OF THE ISLAND OF NORDERNEY
 RELIEF
 PARTICIPATION OF FEDERAL [RELIEF] AGENCIES IN BEACH PROTECTION PROJECTS
 REMEDIES
 COAST EROSION AND PROTECTION - STUDIES IN CAUSES AND [REMEDIES]
 REPORT
 [REPORT] OF ADVISORY-BUARO ON BEACH PROTECTION LOS-ANGELES COUNTY
 [REPORT] OF THE FORESHORE-EROSION-BUARO
 INTERIM [REPORT] ON ASPHALT GROINS AT OCEAN-CITY MARYLAND
 [REPORT] ON BEACH EROSION AT HOLLYWOOD-BEACH FLORIDA

REPORT

(CONTINUED)

NA - (REPORT) ON CONCRETE BLOCK GROINS
 NA - BEACH EROSION CONTROL [REPORT] ON COOPERATIVE STUDY OF VIRGINIA AND BISCAYNE KEYS FLORIDA
 [REPORT] ON EROSION AT MANASQUAN INLET NEW-JERSEY AND ADJACENT BEACHES
 [SUMMARY] ON SHORE EROSION AT TILGHMAN POINT MARYLAND
 [SUMMARY] [REPORT] ON STUDIES OF SAND TRANSPORTATION BY WAVE ACTION
 [REPORT] ON ST. SIMON ISLAND STUDIES
 NA - (REPORT) ON THE USE OF ASPHALT AT GROIN CONSTRUCTION IN DELFTLAND (HOLLAND)
 NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL INTERIM [REPORT] ON THE VENTURA AREA COOPERATIVE BEACH EROSION CONTROL STUDY

CONTROL STUDY

[REPORT] TO THE 15TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 15TH INTERNATIONAL NAVIGATION CONGRESS
 NA - (REPORT) TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 NA - (REPORT) TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 NA - (REPORT) TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 17TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 18TH INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 21ST INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 22ND INTERNATIONAL NAVIGATION CONGRESS
 [REPORT] TO THE 22ND INTERNATIONAL NAVIGATION CONGRESS
 NA - (REPORT) TO THE 22ND INTERNATIONAL NAVIGATION CONGRESS

RESEARCH

NA - COASTAL PROTECTION AND SCIENTIFIC BASIS OF [RESEARCH]
 NA - WHAT WATER ECONOMY EXPECTS FROM COASTAL [RESEARCH]
 NA - SOME IDEAS ON THE PROBLEM OF [RESEARCH] IN COASTAL DYNAMICS AND MODEL TESTS OF COASTAL PROTECTION

RESTORATION

NA - ARTIFICIAL [RESTORATION] OF BEACHES WITH SPECIAL REGARD FOR BEACH FLUSHING NORDERNEY 1951-52

RESTORE

FEDER BEACHES AND GROINS [RESTORE] PRESQUE-ILE PENINSULA

RESUSCITE

PROBLEMS DE DEFENSE DES COTES [RESUSCITE] DE ECHECS DE QUELQUES OUVRAGES

RETAINING

CURVED JETTIES SEA-WALLS BULKHEADS AND [RETAINING] WALLS

REVERE-BEACH

NA - (REVERE-BEACH) MASSACHUSETTS BEACH EROSION CONTROL STUDY
 NA - (REVERE-BEACH) MASSACHUSETTS BEACH EROSION CONTROL STUDY

REVENMENTS

NA - SEA DEFENCE WORKS - GROINS AND [REVENMENTS]

REVIEW

[REVIEW] OF BEACH EROSION AND STORM TIDE CONDITIONS IN FLORIDA 1961-1962
 [REVIEW] OF GERMAN EXPERIENCE ON COASTAL PROTECTION BY GROINS
 COASTAL PROTECTION [REVIEW] OF METHODS FOR DEFENCE

RHODE-ISLAND

NA - WESTERLY (RHODE-ISLAND)
 NA - SOUTH-KINGSTON AND WESTERLY (RHODE-ISLAND) BEACH EROSION CONTROL STUDY
 NA - SOUTH SHORE STATE OF (RHODE-ISLAND) BEACH EROSION CONTROL STUDY

RIPARIAN

MARITIME AND [RIPARIAN] USE OF GABIONS

RIVER

NA - APPENDIX XI OHIO SHORE LINE OF LAKE-ERIE EUCLID TO CHAGRIN [RIVER] BEACH EROSION CONTROL STUDY
 NA - APPENDIX XIV OHIO SHORE LINE OF LAKE-ERIE SHEFFIELD-LAKE-VILLAGE TO ROCKY [RIVER] BEACH EROSION CONTROL STUDY
 NA - NEW-JERSEY COAST OF DELAWARE-BAY FROM CAPE-MAY-CANAL TO MAURICE [RIVER] BEACH EROSION CONTROL STUDY
 NA - AREAS 8 AND 11 SAUGATUCK RIVER TO BYRAM [RIVER] CONNECTICUT BEACH EROSION CONTROL STUDY

5205GR0001
 6209GR0004
 3801GR0002
 4006GR0001
 5201GR0001
 4101GR0001
 4600GR0001
 6206GR0002
 3100GR0002
 3100GR0001
 4900GR0002
 4900GR0004
 4900GR0005
 4900GR0006
 4900GR0001
 4900GR0007
 4900GR0003
 5300GR0003
 6500GR0004
 6900GR0001
 6900GR0004
 6900GR0003
 5700GR0012
 5500GR0004
 5600GR0001
 5700GR0014
 5803GR0001
 5409GR0003
 4001GR0002
 5105GR0001
 5105GR0003
 6705GR0002
 6211GR0001
 6307GR0002
 5311GR0001
 6502GR0002
 5805GR0001
 5002GR0002
 6512GR0001
 5402GR0001
 5304GR0003
 6106GR0001
 5705GR0003

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| RIVER | (CONTINUED) | 5306GR0002 |
| NA - AREA 3 - NEW-HAVEN HARBOR TO HOUSATONIC (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5302GR0002 |
| NA - AREA 6 - NIANITIC-BAY TO CONNECTICUT (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5206GR0001 |
| NA - AREA 4 - CONNECTICUT RIVER TO HAMMONASSET (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5002GR0001 |
| NA - AREA 2 - HAMMONASSET RIVER TO EAST (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5212GR0001 |
| NA - AREA 5 PACTUCK RIVER TO THAMES (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5001GR0001 |
| NA - AREA 1 - ASH CREEK TO SAUGATUCK (RIVER) CONNECTICUT BEACH EROSION CONTROL STUDY | | 5310GR0004 |
| NA - AREA 7 - HOUSATONIC (RIVER) TO ASH CREEK CONNECTICUT BEACH EROSION CONTROL STUDY | | 5705GR0003 |
| NA - AREA 8 AND 11 SAUGATUCK (RIVER) TO BYRAM RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | 5002GR0001 |
| NA - AREA 2 - HAMMONASSET (RIVER) TO EAST RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | 5206GR0001 |
| NA - AREA 4 - CONNECTICUT (RIVER) TO HAMMONASSET RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | 6210GR0002 |
| NA - SAN-GABRIEL (RIVER) TO NEWPORT-BAY ORANGE COUNTY CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY | | 5605GR0002 |
| NA - AREA 9 EAST (RIVER) TO NEW-HAVEN HARBOR CONNECTICUT BEACH EROSION CONTROL STUDY | | 5801GR0001 |
| NA - THAMES (RIVER) TO NIANITIC-BAY CONNECTICUT BEACH EROSION CONTROL STUDY | | 5212GR0001 |
| NA - AREA 5 PACTUCK (RIVER) TO THAMES RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | | 5609GR0002 |
| TIMBER IN THE CONSTRUCTION OF SEA DEFENCE AND (RIVER) WORKS | | 6506GR0001 |
| ROCKAWAY | | 3610GR0002 |
| NA - ATLANTIC COAST OF NEW-YORK-CITY FROM EAST ROCKAWAY INLET TO [ROCKAWAY] INLET AND JAMAICA-BAY NEW-YORK | | 3812GR0001 |
| ROCKAWAY-BEACH | | 5304GR0003 |
| CONSTRUCTION AND MAINTENANCE OF THE PUBLIC BEACH AT [ROCKAWAY-BEACH] BOROUGH OF QUEENS | | 3604GR0001 |
| EFFECTIVENESS OF GROINS AT [ROCKAWAY-BEACH] LONG-ISLAND NEW-YORK | | 3710GR0001 |
| ROCKY | | 5400GR0004 |
| NA - APPENDIX XIV OHIO SHORE LINE OF LAKE-ERIE SHEFFIELD-LAKE-VILLAGE TO [ROCKY] RIVER BEACH EROSION CONTROL STUDY | | 5905GR0001 |
| ROUND-TABLE | | 6207GR0001 |
| [ROUND-TABLE] DISCUSSION | | 0000GR0006 |
| [ROUND-TABLE] DISCUSSION OF SHORE PROBLEMS IN RELATION TO RECREATION | | 6008GR0001 |
| RUN-UP | | 5100GR0002 |
| NA - MODEL TESTS OF WAVE [RUN-UP] ON SEA DYKES IN WATT REGION | | 7000GR0001 |
| SAND | | 3106GR0001 |
| BEHAVIOR OF [SAND] ASPHALT GROINS AT OCEAN-CITY MARYLAND | | 5812GR0001 |
| THE NEARSHORE MOVEMENT OF [SAND] AT DUBBIN | | 6600GR0001 |
| THE BUDD HORIZONTALLY PERMEABLE GROIN SYSTEM FOR BEACH EROSION CONTROL AND REBUILDING [SAND] BEACHES | | 7000GR0001 |
| SCALE EFFECTS IN MODELS WITH LITTORAL [SAND] DRIFT | | 7009GR0002 |
| NA - SEAGROINS ON COASTS WITH WEAK TIDES AND STRONG [SAND] DRIFT | | 5201GR0001 |
| COLORS SAND TESTS WITH LUMINESCENT [SAND] IN GROIN FIELDS | | 6810GR0001 |
| [SAND] MOVEMENT AND BEACH EROSION | | 0000GR0002 |
| MOTION OF [SAND] PARTICLES BETWEEN GROINS | | |
| SEA GROINS EFFECTIVENESS INVESTIGATIONS BY DYED [SAND] TESTS | | |
| COLORS [SAND] TESTS WITH LUMINESCENT SAND IN GROIN FIELDS | | |
| SOME [SAND] TRANSPORT PHENOMENA ON COASTS WITH BARS | | |
| SUMMARY REPORT ON STUDIES OF [SAND] TRANSPORTATION BY WAVE ACTION | | |
| A MATHEMATICAL THEORY ABOUT [SAND] WAVES AND ITS APPLICATION ON THE DUTCH WADDEN ISLE OF VLIELAND | | |
| THE COASTAL DYNAMICS OF [SAND] WAVES AND THE INFLUENCE OF BREAKWATERS AND GROYNES | | |
| SANDUSKY | | 5304GR0002 |
| NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE [SANDUSKY] BAY OHIO BEACH EROSION CONTROL STUDY | | 5212GR0002 |
| SANDWANDERING | | 6100GR0001 |
| NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE [SANDUSKY] TO VERMILLION OHIO BEACH EROSION CONTROL STUDY | | 5609GR0001 |
| SANDY | | 2806GR0001 |
| ARRANGEMENT OF GROINS ON A [SANDY] BEACH | | 2712GR0001 |
| TEST WITH SCALE MODELS TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A [SANDY] BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROINS | | 5010GR0002 |
| SEA DEFENCE EROSION AND PROTECTION ON A [SANDY] COAST | | |
| LITTORAL PROCESSES ON [SANDY] COASTS | | |

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| SANDY-HOOK | 5802GR0002 |
| NA - SHORE OF NEW-JERSEY FROM (SANDY-HOOK) TO BARNEGAT INLET BEACH EROSION CONTROL STUDY | |
| SANDY-HOOK-BAY | 5803GR0001 |
| NA - SHORE OF NEW-JERSEY FROM (SANDY-HOOK) TO BARNEGAT INLET BEACH EROSION CONTROL STUDY | |
| SANTA-BARBARA | 6206GR0003 |
| NA - RARITAN-BAY AND (SANDY-HOOK-BAY) NEW-JERSEY | |
| SANTA-BARBARA | 3803GR0001 |
| NA - BEACH EROSION AT (SANTA-BARBARA) CALIFORNIA | |
| SANTA-CRUZ | 4812GR0006 |
| NA - (SANTA-BARBARA) CALIFORNIA BEACH EROSION CONTROL STUDY | |
| SANTA-CRUZ | 5705GR0004 |
| NA - (SANTA-CRUZ) COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY | |
| SAN-DIEGO | 6009GR0001 |
| NA - (SAN-DIEGO) COUNTY CALIFORNIA APPENDIX IV PHASE 2 BEACH EROSION CONTROL STUDY | |
| SAN-DIEGO | 5605GR0001 |
| NA - OCEANSIDE OCEAN-BEACH IMPERIAL-BEACH AND CORONADO (SAN-DIEGO) COUNTY CALIFORNIA BEACH EROSION CONTROL STUDY | |
| SAN-GABRIEL | 6608GR0001 |
| NA - SPECIAL STUDY OF CITY OF (SAN-DIEGO) (SUNSET-CLIFFS) CALIFORNIA | |
| SAN-GABRIEL | 6210GR0002 |
| NA - (SAN-GABRIEL) RIVER TO NEWPORT-BAY ORANGE COUNTY CALIFORNIA APPENDIX V PHASE II BEACH EROSION CONTROL STUDY | |
| SAN-JUAN | 6209GR0001 |
| NA - (SAN-JUAN) PUERTO-RICO BEACH EROSION CONTROL STUDY | |
| SAN-PEDRO | 4812GR0002 |
| NA - PUNTA-LAS-MARIAS (SAN-JUAN) P. R. BEACH EROSION CONTROL STUDY | |
| SARASOTA | 5311GR0002 |
| NA - APPENDIX II COAST OF CALIFORNIA POINT MUGO TO (SAN-PEDRO) BREAKWATER BEACH EROSION CONTROL STUDY | |
| SASCO-HILL-BEACH | 6200GR0001 |
| PHOTOGRAPHS OF (SARASOTA) COUNTY FLORIDA SHOWING GROIN INSTALLATION | |
| SASCO-HILL-BEACH | 5705GR0002 |
| PHOTOGRAPHS OF (SASCO-HILL-BEACH) FAIRFIELD CONNECTICUT AFTER GROIN CONSTRUCTION AND BEFORE FILL PLACEMENT | |
| SAUGATUCK | 5001GR0001 |
| NA - AREA I - ASH CREEK TO (SAUGATUCK) RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | |
| SCALE | 5705GR0003 |
| (SCALE) EFFECTS IN MODELS WITH LITTORAL SAND DRIFT | |
| TEST WITH (SCALE) MODELS TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROINS | |
| SCATTERED | 6008GR0001 |
| (SCATTERED) GROINS | 2806GR0001 |
| SCHEME THE SELSEY COAST PROTECTION (SCHEME) | 5009GR0001 |
| SCHLESWIG-HOLSTEIN | 6112GR0001 |
| NA - SCHUTZ UND ENTWASSERUNG DER NIEDERUNGSGEBIETE AN DER (SCHLESWIG-HOLSTEINISCHEN) OSTSEEKUSTE | |
| SCHUTZ | 5800GR0002 |
| NA - ABRUCH UND (SCHUTZ) DER STEILOBER AN DER OSTSEEKUSTE | |
| SCHUTZBAUTEN | 5200GR0003 |
| NA - (SCHUTZ) UND ENTWASSERUNG DER NIEDERUNGSGEBIETE AN DER SCHLESWIG-HOLSTEINISCHEN OSTSEEKUSTE | |
| SCHUTZBAUTEN | 5800GR0002 |
| DIE (SCHUTZBAUTEN) AUF DER INSEL BORKUM | |
| SCIENTIFIC | 3512GR0001 |
| NA - A (SCIENTIFIC) BASIS FOR DESIGN OF GROUPE SYSTEMS | |
| SCOURING | 6100GR0002 |
| NA - COASTAL PROTECTION AND (SCIENTIFIC) BASIS OF RESEARCH | |
| SCOURING | 5700GR0012 |
| (SCOURING) DUE TO WAVE ACTION AT THE TOE OF PERMEABLE COASTAL STRUCTURES | |
| SCREW | 6609GR0001 |
| DU-PLAT-TAYLOR ADJUSTABLE (SCREW) PILE GROUPE | |
| SEAFORD-BEACH | 3306GR0001 |
| NA - AN INVESTIGATION INTO THE EFFECTIVENESS OF VARIOUS TYPES OF GROUPE ON (SEAFORD-BEACH) | |
| SEAL-BEACH | 6300GR0001 |
| DESIGN AND CONSTRUCTION OF THE (SEAL-BEACH) GROIN | |
| | 6010GR0001 |

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| SEAWALL | 5900GR0004 |
| SEA-BED | 7009GR0007 |
| SEA-WALL | 6008GR0003 |
| SEA-WALLS | 3105GR0001 |
| SEDIMENT | 4001GR0002 |
| SEEGAT | 5700GR0002 |
| SELKIRK-SHORES | 5200GR0004 |
| SELSEY | 5403GR0002 |
| SEMI-PERMEABLE | 6112GR0001 |
| SHEET | 6500GR0003 |
| EXPERIMENTAL STEEL (SHEET) PILE GROINS AT PALM-REACH FLORIDA | 4910GR0001 |
| LIFE OF STEEL (SHEET) PILE STRUCTURES IN ATLANTIC COASTAL STATES | 4800GR0001 |
| INVESTIGATIONS OF STEEL (SHEET) PILING | 5210GR0002 |
| DURABILITY OF STEEL (SHEET) PILING IN SHORE STRUCTURES | 3607GR0002 |
| (SHEET) STEEL PILING FOR SHORE PROTECTION STRUCTURES | 4410GR0001 |
| SHEETING | 5202GR0001 |
| SEA-WALLS AND GROINS OF STEEL (SHEETING) STABILIZE MIAMI-BEACH | 6210GR0001 |
| SHEFFIELD-LAKE | 3105GR0001 |
| NA - SHORE OF (SHEFFIELD-LAKE) COMMUNITY PARK OHIO BEACH EROSION CONTROL STUDY | 6205GR0001 |
| SHEFFIELD-LAKE-VIL | 5308GR0003 |
| NA - APPENDIX VIII OHIO SHORE LINE OF LAKE-ERIE BETWEEN VERMILLION AND (SHEFFIELD-LAKE-VILLAGE) BEACH EROSION CONTROL STUDY | 5304GR0003 |
| SHINGLE | 6400GR0001 |
| STABILIZATION OF (SHINGLE) ALLUVIAL SHORES BY GROINS OF FULL PROFILE | 7009GR0006 |
| CHARACTERISTICS OF (SHINGLE) BEACHES: THE SOLUTION TO SOME PRACTICAL PROBLEMS | 3807GR0004 |
| SHOREWOOD | 3911GR0001 |
| (SHOREWOOD) PROTECTS ITS LAKE FRONT | 5900GR0001 |
| EFFECTIVENESS OF PERMEABLE TYPE GROINS USED FOR BEACH PROTECTION AT (SHOREWOOD) WISCONSIN AND OTHER CITIES | 6805GR0001 |
| ALONG THE WEST SHORE OF LAKE-MICHIGAN | 7009GR0006 |
| SILTING | 5400GR0005 |
| NA - MODEL INVESTIGATIONS OF HARBOR INLET (SILTING) | 5700GR0004 |
| SIZE | 5002GR0002 |
| EFFECT OF PARTICLE (SIZE) AND DISTRIBUTION ON STABILITY OF ARTIFICIALLY FILLED BEACH PRESQUE-ISLE PENINSULA | 6206GR0002 |
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| CHARACTERISTICS OF SHINGLE BEACHES: THE (SOLUTION) TO SOME PRACTICAL PROBLEMS | |
| SOUTH | |
| NA - GENERAL COASTAL DYNAMICS AND COASTAL PROTECTION OF THE (SOUTH) BALTIC-SEA BETWEEN TRAVE AND SWINE | |
| NA - PROVISIONS FOR STABILIZATION AND MAINTENANCE OF FLOATING ISLANDS OF THE (SOUTH) COAST OF GERMAN NORTH-SEA | |
| SOUTHERN | |
| NA - (SOUTH) SHORE STATE OF RHODE-ISLAND BEACH EROSION CONTROL STUDY | |
| NA - COAST OF (SOUTHERN) CALIFORNIA - SPECIAL INTERIM REPORT ON THE VENTURA AREA COOPERATIVE BEACH EROSION CONTROL STUDY | |

SOUTH-CAROLINA
NA - HUNTING-ISLAND-BEACH [SOUTH-CAROLINA]
NA - BEACH EROSION AT FOLLY-BEACH [SOUTH-CAROLINA]
SOUTH-KINGSTON
NA - [SOUTH-KINGSTON] AND WESTERLY RHODE-ISLAND BEACH EROSION CONTROL STUDY
SOUTH-LAKE-NORTH
NA - PALM-BEACH COUNTY FROM LAKE-WORTH INLET TO [SOUTH-LAKE-WORTH] INLET FLORIDA BEACH EROSION CONTROL STUDY
NA - PALM-BEACH COUNTY FLORIDA FROM MARTIN COUNTY LINE TO LAKE-WORTH INLET AND FROM [SOUTH-LAKE-WORTH] INLET TO BROWARD COUNTY LINE BEACH EROSION CONTROL STUDY
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NA - BEACH EROSION AT WILLOUGHBY [SPIT] VIRGINIA
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THE ORIGIN AND [STABILITY] OF BEACHES
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STABILIZATION
NA - FLOOD PROTECTION AND COAST [STABILIZATION]
INFLUENCE OF GROINS ON BEACH [STABILIZATION]
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NA - PROVISIONS FOR [STABILIZATION] AND MAINTENANCE OF FLOATING ISLANDS OF THE SOUTH COAST OF GERMAN NORTH-SEA [STABILIZATION] OF SINGLE ALLUVIAL SHORES BY GROINS OF FULL PROFILE
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SEA-WALLS AND GROINS OF STEEL SHEETING [STABILIZE] MIAMI-BEACH
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NA - MODEL TESTS OF BEACH BREAK AT THE END OF [STABILIZED] COASTAL BEACHES LEE-EROSION
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NA - APPENDIXES V AND X OHIO SHORE LINE OF LAKE-ERIE BETWEEN ASHTABULA AND THE PENNSYLVANIA [STATE] LINE BEACH EROSION CONTROL STUDY
NA - BEACH EROSION STUDY OHIO SHORE LINE OF LAKE-ERIE FROM OHIO - MICHIGAN [STATE] LINE TO MARBLEHEAD OHIO
NA - LAKE-ERIE SHORE LINE FROM THE MICHIGAN - OHIO [STATE] LINE TO MARBLEHEAD OHIO BEACH EROSION CONTROL STUDY
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NA - SELKIRK-SHORES [STATE-PARK] NEW-YORK BEACH EROSION CONTROL STUDY
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| STEEL | (CONTINUED) | 4800GR0001 |
| EXPERIMENTAL (SHEET PILE GROINS PALM-BEACH FLORIDA | | 5210GR0002 |
| LIFE OF (STEEL) SHEET PILE STRUCTURES IN ATLANTIC COASTAL STATES | | 3607GR0002 |
| INVESTIGATIONS OF (STEEL) SHEET PILING | | 4410GR0001 |
| (STEEL) SHEET PILING FOR SHORE AND BEACH PROTECTION STRUCTURES | | 5202GR0001 |
| DURABILITY OF (STEEL) SHEET PILING IN SHORE STRUCTURES | | 3105GR0001 |
| SEA-WALLS AND GROINS OF (STEEL) SHEETING STABILIZE MIAMI-BEACH | | |
| STEEL | NA - (STEEL) SHORE OF BROOKLYN - CAUSE OF BREAKING *** | 5300GR0005 |
| | NA - BEACH ABRASION BY WAVES - REFLECTION ON (STEEL) WALL TYPE OF COASTAL PROTECTIVE STRUCTURES | 5500GR0005 |
| STEELPILER | NA - ABKUCH UND SCHUTZ DER (STEELPILER) AN DER OSTSEEKUSTE | 5200GR0003 |
| STORM | RECENT (STORM) DAMAGE ALONG THE COASTS OF FLORIDA AND MISSISSIPPI | 4801GR0001 |
| | REVIEW OF BEACH EROSION AND (STORM) TIDE CONDITIONS IN FLORIDA 1961-1962 | 6211GR0001 |
| STRANDBRUHEN | NA - UBER DEN EINFLUSS VON (STRANDBRUHEN) AUF DIE SANDWANDERUNG AN FLACHKUSTEN | 6100GR0001 |
| STRUCTURE | NA - ON THE LENGTH AND THE INTERNAL (STRUCTURE) OF SEASHORE GROINS | 0000GR0007 |
| STRUCTURES | SHEET STEEL PILING FOR SHORE PROTECTION (STRUCTURES) | 6210GR0001 |
| | COASTAL ENGINEERING (STRUCTURES) | 6307GR0001 |
| | SCOURING DUE TO WAVE ACTION AT THE TOE OF PERMEABLE COASTAL (STRUCTURES) | 6809GR0001 |
| | NA - BEACH ABRASION BY WAVES REFLECTION ON STEEP WALL TYPE OF COASTAL PROTECTIVE (STRUCTURES) | 5500GR0005 |
| | A STUDY OF GROINS AND THEIR FUNCTION AS HYDRAULIC (STRUCTURES) | 6107GR0001 |
| | ASPHALT IN BEACH EROSION CONTROL (STRUCTURES) | 6204GR0003 |
| | DURABILITY OF STEEL SHEET PILING IN SHORE (STRUCTURES) | 5202GR0001 |
| | STEEL SHEET PILING FOR SHORE AND BEACH PROTECTION (STRUCTURES) | 4410GR0001 |
| | WINDS WAVES AND MARITIME (STRUCTURES) | 5000GR0001 |
| | CONCRETE SHORE PROTECTION (STRUCTURES) | 4410GR0003 |
| | A PICTORIAL HISTORY OF SELECTED (STRUCTURES) ALONG THE NEW-JERSEY COAST | 6410GR0001 |
| | NA - SWELL AND SURGE AS BASIS FOR PLANNING AND DESIGN IN SEA (STRUCTURES) AND COASTAL PROTECTION | 5800GR0007 |
| | (STRUCTURES) FOR SHORE PROTECTION | 6307GR0003 |
| | NA - SEA TRANSPORTATION (STRUCTURES) III-8 | 4900GR0008 |
| | LIFE OF STEEL SHEET PILE (STRUCTURES) IN ATLANTIC COASTAL STATES | 5210GR0002 |
| | NA - THE EFFECT OF ISLAND PROTECTIVE (STRUCTURES) ON BEACH DEVELOPMENT IN WEST PART OF NORDERNEY | 5500GR0008 |
| | NA - EFFECTS OF COASTAL PROTECTIVE (STRUCTURES) ON SILT | 5700GR0011 |
| | EFFECTS OF LARGE (STRUCTURES) ON THE OHIO SHORE OF LAKE-ERIE | 6400GR0002 |
| | NA - THEORETICAL OBSERVATIONS FOR INSTALLATION OF COASTAL PROTECTIVE (STRUCTURES) ON TIDELESS SHORES | 5300GR0002 |
| | NA - HYDRAULIC (STRUCTURES) (GROINS DAMS DYKES AND CANAL EMBANKMENTS) OF BITUMEN TYPE | 5300GR0004 |
| STUDIES | BEACH EROSION (STUDIES) | 3901GR0001 |
| | BEACH EROSION (STUDIES) | 4000GR0001 |
| | BEACH EROSION (STUDIES) | 4000GR0002 |
| | LAKE-MICHIGAN EROSION (STUDIES) | 5300GR0001 |
| | REPORT ON ST-SIMON ISLAND (STUDIES) | 4101GR0001 |
| | COAST EROSION AND PROTECTION - (STUDIES) IN CAUSES AND REMEDIES | 5200GR0002 |
| | MODEL (STUDIES) IN-SITU OBSERVATIONS | 7000GR0003 |
| | SUMMARY REPORT ON (STUDIES) OF SAND TRANSPORTATION BY WAVE ACTION | 5201GR0001 |
| STUDY | COASTAL ENGINEERING (STUDY) AT POMPAHO-BEACH | 5903GR0002 |
| | NA - BEACH EROSION (STUDY) CORONADO CALIFORNIA | 4202GR0001 |
| | NA - BEACH EROSION (STUDY) LAKE-ERIE SHORE LINE IN THE VICINITY OF HURON OHIO | 4505GR0001 |
| | NA - BEACH EROSION (STUDY) LAKE-MICHIGAN SHORE LINE OF MILWAUKEE COUNTY WISCONSIN | 4604GR0001 |
| | NA - (STUDY) OF AN ARTIFICIAL BATHING BEACH AT ORCHARD-BEACH PELHAM-BAY NEW-YORK | 3711GR0002 |
| | NA - BEACH EROSION (STUDY) OF BAKERS-HAULOVER INLET FLORIDA | 4604GR0002 |
| | NA - SPECIAL (STUDY) OF CITY OF SAN-DIEGO (SUNSET-CLIFFS) CALIFORNIA | 6608GR0001 |

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| STUDY | (CONTINUED) | 5511GR0001 |
| | (STUDY) OF EROSION ALONG HUMER SPIT AND VICINITY KACHEMAK-BAY ALASKA | 5107GR0001 |
| | A (STUDY) OF GROINS AND THEIR FUNCTION AS HYDRAULIC STRUCTURES | 6206GR0001 |
| | A MODEL (STUDY) OF THE BEHAVIOR OF BEACHES AND GROYNES | |
| | LABORATORY (STUDY) OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL TRANSPORT EQUIPMENT DEVELOPMENT AND INITIAL TESTS | 5906GR0001 |
| | EXPERIMENTAL (STUDY) OF THE HYDRAULIC BEHAVIOR OF GROYNES SYSTEMS | 6809GR0003 |
| | EXPERIMENTAL (STUDY) OF THE HYDRAULIC BEHAVIOR OF INCLINED GROYNES SYSTEMS | 7009GR0003 |
| | NA - BEACH EROSION CONTROL REPORT ON COOPERATIVE (STUDY) OF VIRGINIA AND BISCAYNE KEYS FLORIDA | 6209GR0004 |
| | NA - BEACH EROSION (STUDY) OHIO SHORE LINE OF LAKE-ERIE FROM OHIO - MICHIGAN STATE LINE TO MARBLEHEAD OHIO | 4505GR0002 |
| | FUNCTIONS OF GROINS FUNDAMENTAL (STUDY) ON BEACH SEDIMENT AFFECTED BY GROINS (I) | 5700GR0002 |
| | AN EXPERIMENTAL (STUDY) ON THE EFFECT OF COASTAL GROINS | 5810GR0001 |
| | NA - BEACH EROSION (STUDY) ORANGE COUNTY CALIFORNIA | 4002GR0001 |
| | NA - BEACH EROSION CONTROL (STUDY) ST. JOHNS COUNTY FLORIDA | 6607GR0001 |
| | NA - BEACH EROSION (STUDY) ST. SIMON ISLAND GEORGIA | 4010GR0002 |
| ST. AUGUSTINE | SHORE EROSION AND CABBAGE PALMETTO GROINS AT NORTH POINT (ST. AUGUSTINE) FLORIDA | 3811GR0001 |
| | EROSION AND PALMETTO GROINS AT NORTH POINT (ST. AUGUSTINE) FLORIDA | 3912GR0001 |
| ST. JOHNS | NA - BEACH EROSION CONTROL STUDY (ST. JOHNS) COUNTY FLORIDA | 6607GR0001 |
| ST. SIMON | NA - BEACH EROSION STUDY (ST. SIMON) ISLAND GEORGIA | 4010GR0002 |
| | REPORT ON (ST. SIMON) ISLAND STUDIES | 4101GR0001 |
| SUITABILITY | (SUMMARY) OF MODEL TESTS IN MARITIME ENGINEERING IN HARBORS SEAWAYS AND COASTAL PROTECTION | 5600GR0006 |
| SUMMARY | (SUMMARY) REPORT ON STUDIES OF SAND TRANSPORTATION BY WAVE ACTION | 5201GR0001 |
| SUNSET-CLIFFS | (SUMMARY) STATEMENT CONCERNING IMPORTANCE OF A GROIN DESIGN CRITERION | 5810GR0002 |
| | NA - SPECIAL STUDY OF CITY OF SAN-DIEGO (SUNSET-CLIFFS) CALIFORNIA | 6608GR0001 |
| SURGE | NA - (SURGE) AND SHORE CHANGES ON THE WEST COAST OF SYLT | 5500GR0007 |
| | NA - SWELL AND (SURGE) AS BASIS FOR PLANNING AND DESIGN IN SEA STRUCTURES AND COASTAL PROTECTION | 5800GR0007 |
| SWELL | NA - (SWELL) AND SURGE AS BASIS FOR PLANNING AND DESIGN IN SEA STRUCTURES AND COASTAL PROTECTION | 5800GR0007 |
| SYLT | NA - PROTECTION OF THE WEST BEACH OF (SYLT) ISLAND BY FLAT GROINS | 6000GR0002 |
| | INFLUENCE OF PROTECTIVE WORKS ON THE EROSION OF THE WEST COAST OF (SYLT) NORTH-SEA COAST OF GERMANY | 0000GR0003 |
| SYSTEM | THE DYNAMICS OF A COAST WITH A GROYNES (SYSTEM) | 6809GR0001 |
| | THE DYNAMICS OF A COAST WITH A GROYNES (SYSTEM) | 7009GR0008 |
| | FILLING PATTERN OF THE FORT-SHEKIDAN GROIN (SYSTEM) | 5310GR0003 |
| | THE BUDD HORIZONTALLY PERMEABLE GROIN (SYSTEM) FOR BEACH EROSION CONTROL AND REBUILDING SAND BEACHES | 0000GR0006 |
| SYSTEMS | EXPERIMENTAL STUDY OF THE HYDRAULIC BEHAVIOR OF INCLINED GROYNES (SYSTEMS) | 7009GR0003 |
| | EXPERIMENTAL STUDY OF THE HYDRAULIC BEHAVIOR OF GROYNES (SYSTEMS) | 6809GR0003 |
| | COAST PROTECTION - GROYNES (SYSTEMS) | 6204GR0004 |
| | NA - A SCIENTIFIC BASIS FOR DESIGN OF GROYNES (SYSTEMS) | 6100GR0002 |
| TERMINAL | THE (TERMINAL) PROBLEM IN COAST PROTECTION | 6809GR0005 |
| TEST | (TEST) WITH SCALE MODELS TO DETERMINE THE EFFECT OF CURRENTS AND BREAKERS UPON A SANDY BEACH AND THE ADVANTAGEOUS INSTALLATION OF GROINS | 2806GR0001 |
| TESTS | NA - SUITABILITY OF MODEL (TESTS) IN MARITIME ENGINEERING IN HARBORS SEAWAYS AND COASTAL PROTECTION | 5600GR0006 |
| | NA - MODEL (TESTS) OF BEACH BREAK AT THE END OF STABILIZED COASTAL BEACHES LEE-EROSION | 0000GR0004 |
| | NA - SOME IDEAS ON THE PROBLEM OF RESEARCH IN COASTAL DYNAMICS AND MODEL (TESTS) OF COASTAL PROTECTION | 5600GR0001 |

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| TESTS | (CONTINUED) | 5400GR0004 |
| NA - MODEL (TESTS) OF WAVE RUN-UP ON SEA DYKES IN WATT REGION | | 7000GR0001 |
| COLORS SAND (TESTS) WITH LUMINESCENT SAND IN GROIN FIELDS | | 5400GR0002 |
| TEXAS | NA - MODEL (TESTS) WITH MOVEABLE FLOOR IN SEA AND SEA HARBOR CONSTRUCTION | |
| NA - GULF SHORE OF GALVESTON ISLAND (TEXAS) BEACH EROSION CONTROL STUDY | | 5307GR0002 |
| THAMES | NA - AREA 5 PAMCATUCK RIVER TO (THAMES) RIVER CONNECTICUT BEACH EROSION CONTROL STUDY | 5212GR0001 |
| NA - (THAMES) RIVER TO MANTIC-HAY CONNECTICUT BEACH EROSION CONTROL STUDY | | 5801GR0001 |
| THEORETICAL | NA - (THEORETICAL) OBSERVATIONS FOR INSTALLATION OF COASTAL PROTECTIVE STRUCTURES ON TIDELESS SHORES | 5300GR0002 |
| THEORY | A MATHEMATICAL (THEORY) ABOUT SAND WAVES AND ITS APPLICATION ON THE DUTCH WADDEN ISLE OF VLIELAND | 6810GR0001 |
| TIDAL | THE PROTECTION AND IMPROVEMENT OF FORESHORES BY THE UTILIZATION OF (TIDAL) AND WAVE ACTION | 0306GR0001 |
| LAND RECLAMATION AND GROIN-BUILDING IN THE (TIDAL) FLATS | | 7009GR0004 |
| TIDE | REVIEW OF BEACH EROSION AND STORM (TIDE) CONDITIONS IN FLORIDA 1961-1962 | 6211GR0001 |
| TIDELESS | NA - THEORETICAL OBSERVATIONS FOR INSTALLATION OF COASTAL PROTECTIVE STRUCTURES ON (TIDELESS) SHORES | 5300GR0002 |
| TIDES | NA - SEAGROINS ON COASTS WITH WEAK (TIDES) AND STRONG SAND DRIFT | 5100GR0002 |
| TILGHMAN | REPORT ON SHORE EROSION AT (TILGHMAN) POINT MARYLAND | 4006GR0001 |
| TIMBER | (TIMBER) IN THE CONSTRUCTION OF SEA DEFENCE AND RIVER WORKS | 5609GR0002 |
| TOPOGRAPHY | VARIATION OF (TOPOGRAPHY) OF SEA-BED CAUSED BY THE CONSTRUCTION OF BREAKWATERS | 7009GR0007 |
| TRANSPORT | LABORATORY STUDY OF THE EFFECT OF GROINS ON THE RATE OF LITTORAL (TRANSPORT) EQUIPMENT DEVELOPMENT AND INITIAL TESTS | |
| SOME SAND (TRANSPORT) PHENOMENA ON COASTS WITH BARS | | 5906GR0001 |
| TRANSPORTATION | SUMMARY REPORT ON STUDIES OF SAND (TRANSPORTATION) BY WAVE ACTION | 7009GR0002 |
| NA - SEA (TRANSPORTATION) STRUCTURES III-B | | 5201GR0001 |
| TRAVE | NA - GENERAL COASTAL DYNAMICS AND COASTAL PROTECTION OF THE SOUTH BALTIC-SEA BETWEEN (TRAVE) AND SWINE | 4900GR0008 |
| TRAVEL | OBSERVATIONS ON THE (TRAVEL) OF SHORE MATERIAL ALONG A CHALK FORESHORE | 5400GR0005 |
| TRISCHEN | NA - ORIGIN AND DECLINE OF THE ISLAND (TRISCHEN) | 5409GR0005 |
| TWO-RIVERS | NA - MANITOWOC COUNTY FROM (TWO-RIVERS) TO MANITOWOC WISCONSIN BEACH EROSION CONTROL STUDY | 5000GR0002 |
| UFERVERANDERUNGEN | NA - (UFERVERANDERUNGEN) UND KUSTENSCHUTZ AUF SYLT | 5602GR0002 |
| UNDERWATER | NA - (UNDERWATER) LONGITUDINAL WORKS FOR COASTAL PROTECTION | 5700GR0006 |
| UNFINISHED | (UNFINISHED) BUSINESS NEW-JERSEY GROIN PROJECT STALLED BY WINTER | 5200GR0001 |
| UNITED-STATES | SHORE PROTECTION EXPERIENCE IN THE (UNITED-STATES) | 5904GR0001 |
| UNTERSUCHUNGEN | NA - GUTACHTLICHE STELLUNGNAHME ZU DEN (UNTERSUCHUNGEN) UBER DIE URSACHEN DER ABRUCHERSCHENUNGEN AM WEST UND NORD WESTSTRAND DER INSEL NORD-RENEY | 6707GR0001 |
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| | | 5700GR0007 |

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| URSACHEN | - GUTACHTLICHE STELLUNGNAHME ZU DEN UNTERSUCHUNGEN UBER DIE [URSACHEN] DER ABRUCHERSCHNEIDUNGEN AM WEST UND | 5200GR0006 |
| NA | NORD WESTSTRAND DER INSEL NORDERNEY | 5200GR0005 |
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| VARIATION | [VARIATIONS] IN GRUIN DESIGN | |
| VARIATIONS | [VARIATIONS] IN GRUIN DESIGN | |
| VENTURA | NA - COAST OF SOUTHERN CALIFORNIA - SPECIAL INTERIM REPORT ON THE [VENTURA] AREA COOPERATIVE BEACH EROSION CONTROL STUDY | 7009GR0007 |
| VERMILLION | NA - APPENDIX VIII OHIO SHORE LINE OF LAKE-ERIE BETWEEN [VERMILLION] AND SHEFFIELD-LAKE-VILLAGE BEACH EROSION CONTROL STUDY | 6705GR0001 |
| VERSUS | NA - APPENDIX IV OHIO SHORE LINE OF LAKE-ERIE SANDUSKY TO [VERMILLION] OHIO BEACH EROSION CONTROL STUDY | 6510GR0001 |
| VICINITY | THE NORTH SHORE [VERSUS] LAKE-MICHIGAN | 6206GR0002 |
| STUDY | STUDY OF EROSION ALONG HOWER SPIT AND [VICINITY] KACHEMAK-BAY ALASKA | 5308GR0003 |
| NA | - FORT-MACON - ATLANTIC-BEACH AND [VICINITY] NORTH-CAROLINA | 5212GR0002 |
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| NA | - ON THE FLOW CHARACTERISTICS IN THE [VICINITY] OF GROINS | 6511GR0001 |
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| NA | - BEACH EROSION CONTROL REPORT ON COOPERATIVE STUDY OF [VIRGINIA] AND BISCAYNE KEYS FLORIDA | 4305GR0001 |
| NA | - VIRGINIA-BEACH [VIRGINIA] BEACH EROSION CONTROL STUDY | 3801GR0003 |
| NA | - COLUMBIA-BEACH [VIRGINIA] BEACH EROSION CONTROL STUDY | 6209GR0004 |
| NA | - VIRGINIA-BEACH [VIRGINIA] COOPERATIVE BEACH EROSION CONTROL STUDY | 5306GR0004 |
| VIRGINIA-BEACH | NA - [VIRGINIA-BEACH] VIRGINIA BEACH EROSION CONTROL STUDY | 4909GR0001 |
| NA | - [VIRGINIA-BEACH] VIRGINIA COOPERATIVE BEACH EROSION CONTROL STUDY | 6204GR0005 |
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| NA | - [WAIKIKI-BEACH] OAHU HAWAII BEACH EROSION CONTROL STUDY | 6810GR0001 |
| WAIKIKI-BEACH | NA - [WAIKIKI-BEACH] OAHU HAWAII BEACH EROSION CONTROL STUDY | 5308GR0001 |
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| 13. ABSTRACT <p>A groin is a shore protective structure built (usually perpendicular to the shore) to trap sedimentary material or to retard erosion of the shore. Of all the shore protective structures used by coastal engineers, the groin is the most difficult to design - functionally and structurally. Because this complexity of design was not recognized until recently, many early groin installations were failures. CERC supports a continuing research program devoted to gaining a better understanding of groins. This bibliography evolved from the groin research program.</p> <p>About 460 articles published since 1900 on groins and groin-type structures are presented in this bibliography. Annotations accompany each bibliographic entry where possible. Indexes of authors, titles, and subjects are included to aid the researcher. Unavailable literature such as foreign articles, although not annotated, are included as entries in both the annotated section and the indexes.</p> | | | |

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